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PREFACE.

The favour with which the Lectures on "The Growth and Prospects of Canada"—published in 1852—were received, having made me feel as if under obligation to attempt something on the same subject fuller and more complete, the following Essay was prepared and forwarded to Quebec in answer to the Advertisement of the Executive Committee of the Paris Exhibition. Having been passed by unread on the alleged ground of the illegibleness of the Manuscript—(which, however, I feel warranted in saying, as well as called on in justice to myself to say, was quite capable of being "*deciphered*" without any trouble unreasonable in the circumstances)—I have assumed the responsibility of its publication, partly that, as the fact of my having written was known, such as choose to honour me with a perusal may have an opportunity of forming their own judgment as to the character of my contribution, and partly in the hope of aiding in the diffusion of information respecting a country of which, after a trial of over twenty-one years, I entertain a very high opinion.

That in dealing with matters so various and of such a character as those embraced in the following pages I should have escaped all mistake, I dare hardly venture to hope,

notwithstanding the pains which have been taken to secure absolute correctness. At the same time my persuasion is, that no mistake will be discovered interfering in any measure with the reliableness of the general views presented. Those who have given the subject fair attention, or who may be disposed to put themselves to the trouble of examining the authorities adduced, will perceive that facts are under rather than over-stated.

In forwarding the Essay to Quebec, I mentioned that I had some fear, being uncertain as to the wishes of the Executive Committee on the point, that I might have gone somewhat too largely into the subject of Geology in connection with the Local Descriptions; adding, that the matter in question was easily separable, and that had time permitted it had been my intention to inclose in brackets certain portions which might, if thought well, be omitted. Unwilling to tax too much the patience of the general reader with what is technical, I have excluded a few of the passages referred to. Should any be of opinion that too much of this description is still retained, I beg to remind them that the Geological character of the country is one of the elements which specially contribute to make it such a comfortable home, and such an advantageous field of enterprise for its inhabitants, and to call attention to the fact that the regions most largely dwelt on—those, to wit, of Lakes Superior and Huron—may be said almost to form countries of themselves, and are besides comparatively little known.

Some few additions which have been made, have been placed in square brackets, by which they may be easily distinguished.

Had time permitted, and my means of information been greater, something might possibly have been produced less unworthy of the subject. Conscious, however, of having done the best I could in the circumstances, I throw myself on the candour of the Reader, to whose judgment I now submit these pages, and who will learn the Principle by which I have been guided in their composition from the Advertisement on the next page, which formed the original Introduction to the Essay.

A. LILLIE.

Toronto : August, 1855.

ADVERTISEMENT.

The aim of the writer of the following Essay has been to furnish replies, as far as in his power, to the more important questions which an intelligent Stranger, one especially entertaining the idea of taking up his residence here, might be disposed to put in relation to the Country. To secure this end he deems it essential that the statements made be as reliable as possible. He has, therefore, confined himself to the best authorities; and that the full weight of these may be felt, he has been careful to give references, and has, whenever practicable, made use of their words. This, though it may, perhaps, with some lessen the attraction of his production by taking away from it the air of originality which it might with much less labour than has been bestowed upon it have been made to wear, he has regarded as an act of justice to all parties—the Authors relied on, the Reader, the Country, and himself.

PART FIRST.

PHYSICAL.

Although so early as the year 1479 Giovani Gaboto, usually called John Cabot, had made the Gulf of St. Lawrence,—followed by Gaspar Cortreal in A.D. 1500, Baron de Lery in 1518, and Giovani Verrazano in 1522,—the honour of discovering Canada belongs to Jacques Cartier, a native of France, commissioned by Francis 1st., who was the first to sail up the St. Lawrence, which he entered in August, 1534, on the Festival of St. Laurent (whence the name given the River), having the year previous penetrated as far as the Bay of Chaleur.

The name Canada, by which this splendid country is designated, is conceived to be derived from the Iroquois word "Kanata," a collection of huts—supposed to be applied by mistake to the region. As, however, the Mohawks use the above word even now to signify, in addition, the banks of a river or stream, it may be that the appellation was, according to their common custom, used descriptively to denote "the Country on the Banks of the River."

Canada lies between the parallels of 41° 52′ and 51° 30′ North, and 57° 50′ and 91° 20′ West. Stretching in a south-westerly direction, from the Island of Anticosti in the Gulf of St. Lawrence, to the south-eastern extremity of Lake Erie, its length is about 1,400 miles; in breadth it varies from 200 to 400. Including water-surface, it is computed to comprise an area of 349,821 square miles, or 242,482 exclusive of water.

The number of acres contained within it is estimated at 160,405,219,—of which 128,659,684 are reckoned to Canada East, and 31,745,535 to Canada West.

Mr. Logan, (Geological Report for 1845–6, pp. 5, 6,) drawing a line in continuation of the Hudson River and Lake Champlain valleys, divides the Province into three sections: the first, which he terms the "Eastern area," "comprising that portion which lies to the eastward of the divisional line assumed, and to the South of the St. Lawrence;" the "Western area," or second section, "extending from the limits of the Province in an opposite direction, and bounded on the north by a line skirting the St. Lawrence, the Ottawa, the Matawa, Lake Nipissing, and the French River, to Lake Huron, and thence along the northern shore of this Lake to Sault Ste. Marie on Lake Superior;" the third embracing what he designates "Northern Canada," "extending from the British limit on Lake Superior to Labrador, and lying between the northern boundary of the east and west divisions, and the height of land separating the Hudson Bay waters from those of the St. Lawrence."

Including the Island of Anticosti, the first of these sections is described as covering a space of about 40,000 square miles, the second of 50,000, and the third of 250,000, or thereabout; making in all 340,000,—somewhat less than has been stated above, water-surface included.

GEOLOGICAL STRUCTURE OF CANADA.

The first and second of the sections above named, Mr. Logan states to be marked by "important differences in their geological conditions;"—the characteristic of the former being "the general quiescence and conformable sequence of its formations;" and that of the latter, their "violent contortions and unconformable relations."

The Geological formation most prevalent in Canada is that

usually called Eruptive or Metamorphitic, but designated by Mr. Logan, as also by Marcou (after Mr. Garneau), the "Laurentine System," from the circumstance of its composing the larger portion of the elevated region north of the St. Lawrence, already referred to.

The fundamental rocks of the Laurentine System, as also of the Rocky, Alleghany, and Ozark Mountains, Marcou states, (in his Geological Map of the United States and British North American Provinces,) to be Granitic, Syenitic, and Porphyritic. These form, according to him, a frame-work of plutonic origin, which supports the basins of sedimentary rocks that surround them.

"The first sedimentary beds deposited (he says p. 19) after the crust of the earth had become solidified, were submitted to various metamorphic action by the often-repeated injection of ignited matter in a liquid state, and also by the high temperature that still prevailed at the surface, which caused much more numerous chemical combinations than those that take place in our day. These first stratified rocks, thus modified, form gneiss, mica-schist, slate, and marble."

Of the Laurentian series Mr. Murray gives the following description:

"These rocks consist of masses of micaceous and hornblendic gneiss, and masses of crystalline limestones, interspersed by gneiss. In the great masses of gneiss the prevailing color appears to be reddish, but they are frequently striped with interstratified bands of grey, the reddish part taking its general aspect from the reddish feldspar, which is the principal constituent, while the grey is chiefly made up of small grains of white quartz and feldspar, with small scales of black mica, and occasionally grains of black hornblende. The rock is for the most part fine grained; there are, however, masses of a coarse texture, which may be veins, but apparently maintaing a parallelism with the bedding, cannot with certainty be considered so. These latter masses were found in general to be chiefly of feldspar, sometimes white and sometimes red, more frequently

the former, which, weathering often to an opaque white, causes them to contrast strongly with the other associated rocks. Beds also occur, of which almost the only constituent is white quartz, and these often alternate with thin layers of yellowish-white feldspar."

The Laurentine System may be described as occupying, over and above certain portions of Mr. Logan's first and second divisions of the Province, the whole, or nearly so, of his third, or what he calls "Northern Canada."

The Lower Silurian Strata hold, as to extent of prevalence, the place next to the Laurentine among the formations of Canada.

Of the general character of this formation, the following description is given by Marcou: "The first strata are thick beds of very hard Sandstone, rose-coloured or whitish-grey. Then comes a series of strata of compact Limestone, blue, often blackish, with quite numerous fossils, the whole surrounded by schistose, slaty clay, of a deep black or blue-grey colour."

Potsdam Sandstone, Calciferous Sandrock, Black River Limestone group, Trenton Limestone, Utica Slate, Hudson River group, are the designations used for this system by the Geologists of New York. In Vermont the denomination *Isle La Motte* is substituted instead of *Black River Limestone.* Mr. Logan calls it, as exhibited in the district of Gaspé and Quebec, *Conglomerate Limestone, Tourette's Sandstone, Graptolite Schist.* (p. 20.)

"In most of the localities where the Lower Silurian Strata are observed, they may be separated into three distinct divisions, which are found constantly with the same characteristics throughout the band of Silurian rocks which accompany the Laurentine Mountains and the Alleghanies." The first of these divisions, called by Marcou the *Potsdam formation,* is "a very hard sandstone, of subcrystalline texture, and very diffuse stratification;"—containing "few fossils," so far at least as variety of species are concerned, the *Lingula* and the *Obolus*

or *Ungulites* being "the most characteristic." "This Sandstone is sometimes calcareous," in which case "it is distinguished from *Potsdam Sandstone* by the special name of *Calciferous Sandrock.*" "Its thickness varies with the different localities in which it is found, and depends on the more or less horizontal position of the bed; nevertheless it may be said to vary from five hundred to two thousand feet."

This division of the Lower Silurian presents itself "of great extent" at the Falls of Montmorenci. It prevails also "on the borders of the Ottawa, of the Two Mountains' River, of the St. Lawrence (Thousand Isles), near Lake Simcoe;—on the Escanaba River, near Lake Michigan, and at Janesville, near Milwaukee."

The second division of the Lower Silurian, which the authors of the "Geological Survey of New York" subdivide into the *Black River Group*, and the upper *Trenton Limestone*;—the *Trenton formation* of Marcou—"is composed chiefly of blue limestones, with intercalation of clay of the same colour." Such is the development of crustacea, mollusks, and polyps, exhibited in this division, that Mr. James Hall describes, in his work on the "Palæontology of New York," two hundred and ninety-five species belonging to it; the most characterisic of which—the *Illaenus Crssai-couda*, the *Orthoceratites communis*, the *Bellerophon bilobatus*, and the *Spirifer Lynx*—are found in Canada.

In Pennsylvania this division of the Lower Silurian attains a depth of from four to five thousand feet. "Recognized by Bayfield at the Mingan Islands and in Newfoundland, it pursues the whole length of the St. Lawrence, then the River Richelieu, Lake Champlain, and the Mohawk, ascends the Ottawa nearly to Lake Nipissing, follows the east and north coasts of Lake Ontario, enters Lake Huron by Georgian Bay, and continues to Wisconsin and Illinois, where it contains the rich lead mines of Galena. Finally, it enters Minnesota, where it forms part of the descent for the Falls of the Mississippi, at St. Anthony. Its existence has been verified on Lake

Winnipeg, near Fort Alexander, along the Red River, at Lakes Abbitibbe and St. John's, in the Hudson's Bay Territory."

"A third division, composed of Argillaceous Schist, very fissile, and resembling slate, terminates the Lower Silurian." In New York and Canada it bears the names of *Utica Slate* and *Hudson River Group*, "and occupies the first rank in the series of sedimentary rocks, owing to the great thickness of its beds and the extent of country which it covers." Graptolites, with fragments of Tribolites, are the only fossils found in this division.

The basins of the St. Lawrence and the Hudson belong specially to this division, which extends itself from near Cape Roziére, at the extremity of Gaspé, to Virginia, "where it still has a depth of three thousand feet." It is found in Upper Canada, and at the Bay Des Noquets, in Lake Michigan. At Lake Superior it has likewise been verified, "where it forms the Cataract of Kakabeca, on the River Kaminitiquia." It is described as forming "a band of rocks which, varying from three to ten miles in width, extends uninterruptedly over seven degrees of Latitude, without important variation either in its mineralogical constitution or its stratification." (Marcou—pp. 20–25.)

As distinguished from the *Lower*, the *Upper Silurian*, called by Mr. Logan *Limestone* and *Schist of Gaspé*, is composed of a light-grey limestone, becoming sometimes blue-grey, with interposition in many places of bluish-grey clay."

Though generally following the direction of the Lower Silurian, the Upper varies a little from that in its geographical distribution.

"Beginning near the Straits of Belle Isle, Newfoundland, it forms the whole Island of Anticosti, and part of Cape Rozière and the point of Gaspé, and extends to the south of the mountains of Notre Dame—from whence it crosses the Metapediac River, gains the Madawaska and the Temiscouata Lake, ascends the St. John, crosses the Chaudiére and St

Francis; and finally reaches Lake Memphramagog, on the borders of Canada and Vermont, penetrates a little way into that State, and loses itself in the ramifications of the Green Mountains." Found again at several points in New Brunswick, and at Eastport, in Maine, it has been verified by Mr. Logan "on Lake Temiscaming, in the Hudson's Bay Territory." Crossing Upper Canada from the southern border of Lake Ontario, where it has a considerable development, "it forms a part of the Manitoulin Islands, in Lake Huron, and the north and west sides of Lake Michigan; then, forming the Upper part of the State of Illinois, it ascends into Iowa and Minnesota, where it forms the upper part of the Falls of the Mississippi, at Fort Snelling." Among western Geologists it bears the name of *Cliff Limestone*, from the circumstance of its forming the cliffs of the numerous hills in the portion of the basins of the Ohio and the Tennessee in the environs of Cincinnati, Louisville, and Nashville.

Of the fossils characteristic of the Upper Silurian, Marcou specifies the *Pentamerus Oblongus*, the *Orthis Hybrida*, and the *Leptoena depressa*, as found in Canada.

Beds of rock-salt are often found in America, in connection with the Upper Silurian. The cataract of Niagara is stated to be "entirely formed of rocks belonging to the Upper Silurian." (Marcou—pp. 25–28.)

The Devonian formation presents itself at a number of places in Canada, as at Gaspé, the most northerly point in which it is met with in America—where it obtains a development approaching the immense depth observed in the State of New York; on Lakes Erie, St. Clair, Huron, and Michigan; and the Rivers Restigouch and St. John.

"The first strata of the Devonian are formed of whitish-grey limestone, containing a great number of fossils. Then numerous beds of black Schistose clay are superposed, as in the States of New York and Pennsylvania; and finally, in some places, as Gaspé and Katskill, these beds are crowned by very thick beds of Red Sandstone, with very few fossils."

The whole contour of Lakes Erie and St. Clair is stated by Marcou to be formed of the Devonian, as also a part of the Peninsula of Michigan, the Island of Mackinaw, and the southern side of Lake Michigan.

On Lakes Erie, Huron and Michigan, and in the basins of the Ohio and Mississippi, it is composed, according to him, "of one group of strata, containing very fossiliferous limestone beds, of a light-grey colour, often whitish, and following the limestone of the Silurian, with which they have much lithologic analogy."

Mr. Logan terms this formation *Calcareous Schist of Gaspé,* (upper part,) and the *Sandstone of Gaspé;* the name under which Mr. Murray particularizes it, when speaking of Upper Canada, is *Upper Limestone.*

Of the Devonian fossils, only the *Calymene bufo* and the *Zaphrentis gigantea,* are specified as found in Canada (Marcou—pp. 28–32.)

New Red Sandstone, called by Mr. Logan *Conglomerate Limestone* and *Red Sandstone,*—which belongs to the class of *Secondary Rocks,*—is found at Gaspé;—and on Lake Superior, according to Marcou, though Messrs. Logan, Foster, and Owen regard the stone found there as the same with the Potsdam.

The general character of the rocks composing this formation is stated to be a development of Red Sandstone, sometimes whitish-grey in thin, and often Schistose strata, of variable hardness, though generally very tender, and having the lithologic form known in the United States by the name of Freestone.

At Lake Superior, with a number of other places named, Marcou describes the formation as presenting often "long lines of nearly horizontal beds, capped by masses of Trap, similar to the masses of basalt of Auvergne and Ireland, and, like them, divided transversely, and presenting the columnar structure so celebrated in the Giant's Causeway." Many points of the northern coast of the Lake, as well as the whole of the

southern, according to him,. present this peculiar formation. "Point Keewena and Isle Royale are," he says, "specially celebrated for the rich mines of native Copper and Silver contained in trap which crosses it."

Impressions of rain drops are met with at Lake Superior, and other places, in connection with this formation. (Marcou, pp. 39–42.)

"On the heights which border the St. Lawrence, from its mouth to its source, that is, to Seven Beaver Lake, the source of the St. Louis River,—the first name of the St. Lawrence,—varying from fifty to one hundred feet, are found deposits of sand and clay, often forming terraces above the river, which contain shells identical with those that live now in the waters of the River and the Gulf of St. Lawrence. Lake Champlain and the River Richelieu, also present the same phenomena. The difference between these deposits of sand and clay and those further south is, that they overlay a formation, often considerable, composed of drift, boulders, and scratched and polished Rocks, which is special to the Polar regions, or to the high mountain chains of the temperate and equatorial zones." This formation of drift and boulders is "chiefly marked by sand and clay, enclosing blocks which vary from the size of a pebble to that of an enormous rock, and which have been transported various distances from the point where they were formed. A constant and particular phenomenon of this formation is the marks of the passage of these blocks and gravel upon all the rocks that form the country where they are found. These marks consist of scratches, often very fine, the majority of which follow a certain direction; although in America a surface is seldom found with all the scratches parallel, which sometimes occurs, within narrow limits, in the Alps. The scratches occasionally cross one another at all angles, from zero to ninety degrees, though they have still a general direction, which the crossing does not change; and they are imprinted with the same regularity on all sorts of rocks, even the Conglomerate, which are composed

of fragments of various hardness; which shows that the force that produced them must have been uniform and powerful."

In regard to the origin of these scratches difference of opinion exists;—some ascribing them to the action of glaciers, while others hold them to have been occasioned by the attrition of floating ice. The latter is the opinion to which Marcou seems inclined, as also Sir Charles Lyell; while Mr. Logan appears disposed to lean to the former. (Marcou—pp. 53, 54; Report of Geological Survey of Canada for 1845–46, pp. 70–74; Lyell's Travels in North America in 1840–42, Vol. II., p. 83.)

"The greater part of the American Drift and Boulders," Marcou thinks, "are due to ice-bergs and ice-cakes, still so common now on Lake Superior, on the coast of Labrador, the Banks of Newfoundland, and on Hudson's Bay." (54.) In this opinion Sir Charles Lyell seems to concur. (Travels in 1840–42, Vol. II., pp. 83, 84.)

Marcou notices frequently the correspondence in certain particulars between the strata of Canada and those of Scandinavia. On this point Lyell expresses himself as follows respecting the valley of the St. Lawrence and its environs, to which he describes his observations as having been confined: "I seemed," he remarks, "to have got back to Norway and Sweden, where, as in Canada, gneiss and mica-schist, and occasionally granite, prevail over wide areas, while the fossiliferous rocks belong either to the most ancient or the very newest strata, to the Silurian rocks, or to deposits so modern as to contain exclusively shells of recent species. In both countries, we pass over enormous spaces without beholding any formations of an intermediate age. In both, large erratics, or far-transported fragments of rocks, have been carried from north to south, while the surfaces of solid rocks covered at various heights by gravel, sand, and clay, have been smoothed and furrowed."

"There are large parts of Scandinavia, where the Silurian strata have not been invaded by trappean rocks, whether felspathic or basaltic. There are others, where these igneous

minerals have intruded themselves, both in the form of dykes and overlying masses, as in Sweden, at Kinnekulle, near Lake Wener, and in Norway, near Christiana. The same geological condition recurs in Canada, the mountain of Montreal affording a good example of slightly disturbed Silurian limestone full of shells and corals, with a thick capping of basalt or greenstone about eighty feet thick, which terminates abruptly towards the river, giving a picturesque outline to the hill. Numerous dykes or veins of trap, both felspathic and augitic, are seen penetrating the limestone, and some of them sending ramifications through it.

"The termination downwards," he continues, "of the most ancient fossiliferous rocks of Canada in a stratified quartzose sandstone, with few fossils, affords another point of analogy between the geology of Scandinavia and North America. An additional one is supplied by the unconformable superposition in both hemispheres of the inferior sandstone to gneiss." (Vol. 2d, pp. 103–105.)

Elsewhere he notices, as a point of coincidence, the abundance in Scandinavia and Canada of fossil shells of the following species, now living in the northern seas, viz. :—*Saxicava rugosa, Mya truncata, Mya arenarea, Tellina calcarea, Tellina Groenlandica, Natica clausa,* and *Bolanus uddevalensis.*" (Ibid. p. 122.)

By way of general sketch of the geology of the Province, the above may, we presume, suffice, as we shall have an opportunity of introducing such additional particulars as may be of special interest, whether in a general or local point of view, when dealing with its geography.

Before passing to that, let us notice briefly the more important of the mineral and economic materials stored up within these strata for the use of the future inhabitants of this "good land," through means of which the God of nations has made such munificent provision for her well-being and her power.

The following summary we derive from a catalogue appended

to the Report of the Geological Survey for 1849-50, (pp. 107-115), whose arrangement we follow :—

Class 1st—METALS AND THEIR ORES.

IRON—*Magnetic, Specular, Bog,* and *Titaniferous.*
ZINC and LEAD—*Sulphurets.*
COPPER—*Vitreous Sulphuret,* with *silver.*
Native Copper, with *silver.*
Yellow and *variegated sulphurets.*
Argentiferous yellow sulphuret.
Argenti-auriferous yellow sulphuret.
NICKEL—*Sulphuret, &c.;* with *iron pyrites; nickel ochre.*
SILVER—*Native, &c.*
GOLD—*Native, in gravel and vein.*

Class 2d.—CHEMICAL MATERIALS, being such as require peculiar chemical treatment to fit them for use.

URANIUM—(*For glass staining and porcelain painting, &c.*)
CHROMIUM—(*For glass staining, porcelain and oil painting, &c.*)
COBALT—(*For glass staining and porcelain painting, &c.*)
MANGANESE, BOG—(*For bleaching and decolorizing agents.*)
IRON PYRITES—(*For manufacture of copperas and sulphur.*)
DOLOMITE, with 45 per cent. of CARBONATE of MAGNESIA—(*For manufacture of Epsom Salts and the Magnesia of commerce.*)
MAGNESITE, with 83 per cent. of CARBONATE of MAGNESIA—(*For the same purpose*).

Class 3d—STONE PAINTS.

BARYTES—*Permanent white.*
IRON OCHRE—*Yellow ochre, Spanish brown, &c.*
TALCOSE SLATE—*Ochre yellow, French white.*

Soapstone—*White, very pure.*
Serpentine—*Greenish white.*
Ferruginous Clay—*Light red.*

Class 4th—MATERIALS APPLICABLE TO THE ARTS.

Lithographic Stone—Quantity large, and exposures numerous.

Class 5th—MATERIALS APPLICABLE TO JEWELLERY AND ORNAMENTAL PURPOSES.

Agates, Jasper, Labradorite, Sunstone, Hyacinthus, Oriental Rubies, Saphires, Amethysts, Ribboned Chert (*for cameos*), and Jet.

Class 6th—MATERIALS FOR GLASS-MAKING.

White Quartz Sandstone, Pitchstone, Basalt and Allied Rocks (*For black glass.*)

Class 7th—REFRACTORY MATERIALS.

Soapstone, Asbestus, Sandstone, and Plumbago.

Class 8th—MANURES.

Phosphate of Lime, Gypsum, Shell Marl.

Class 9th—GRINDING & POLISHING MATERIALS.

Mill-stones—*Silicious conglomerate; Granular and corneous Quartz rock, Granite, Pseudo-Granite (without Quartz grains).*
Grindstones—Of various descriptions.
Whetstones and Hones—Very abundant.
Canadian Tripoli—*A siliceous infusorial deposit.*

Class 10th—MATERIALS FOR PAVING, TILING, &c.

Roofing Slates—*Flag Stones*, widely spread.

Class 11th—BUILDING MATERIALS.

Granite—*Of superior quality, white, and cleavable;* very widely spread.

PSEUDO-GRANITE—*Without Quartz grains, white, cleavable.*

SAND-STONE—*Yellowish white.* Widely spread.

CALCAREOUS SAND-STONE.

LIMESTONE—Scattered over the whole country.

LIME—*Common, Magnesian, Hydraulic.*

Class 12th—MATERIALS FOR BRICKS, TILES, and POTTERY.

CLAY—*For Red and White Bricks, and for Tiles and Common Pottery.*

MARBLE—*White* (a Dolomite), *Black, Brown, Grey and Mottled, Variegated, white and green, Verd Antique, Serpentine.*

Class 13th—COMBUSTIBLE MATERIALS.

PEAT—Abundant in many places.

PETROLEUM, NAPTHA, ASPHALT.

Class 14th—SUNDRY OTHER MATERIALS.

MOULDING SAND, FULLER'S EARTH.

From later Reports the following additions are derived :—

Class 1st—ILMENITE, GALENA, PLATINUM, IRIDOSMINE.

Class 2d—CHROMIC IRON, MOLYBDENITE.

Class 5th—FELSPAR, ORTHOCLASE, ALBITE, ANORTHITE, TREMOLITE, MARMOLITE.

Class 7th—PIPESTONE.

Class 11th—QUICKLIME.

Class 14th—PHOSPHATE OF IRON;—*Mineral paint; Mineral Caoutchouc; Scapolite; Lievrite; Celestine; Apatite; Sphene; Rutile; Allanite.*

New Species—WILSONITE, LOGANITE.

(Reports 1850-51, pp. 35-46; 1851-52, pp. 94-98; 1852-53, pp. 142; 168-173.)

For the localities and quantities in which these very varied

materials are met with, we must refer the reader to the catalogue and Reports above referred to, simply remarking that the more important of them are spread over a considerable portion of the country, and in an abundance which, besides supplying our own wants, will afford the means of an extensive foreign commerce.

In relation to the mineral portion of the Canadian Exhibition at the World's Fair, the following judgment was pronounced in the Report of the Jury on Mineral Products, drawn up by M. Dufrénoy, Juror for France, Member of the Institute of France, and Inspector-General of Mines in that country :—

"Of all the British colonies, Canada is that whose exhibition is the most interesting and the most complete, and one may even say that it is superior, so far as the Mineral Kingdom is concerned, to all countries that have forwarded their productions to the Exhibition. This arises from the fact that the collection has been made in a systematic manner, and it results that the study of it furnishes the means of appreciating at once the Geological structure and Mineral resources of Canada."

"It appears to me," says Mr. Logan, "that the Mineral collection made as favourable an impression on the public at large as upon the Jury; and most of the metropolitan daily journals noticed it with approbation; and a detailed description of it is given in the Hand-Book to the Official Catalogue by Mr. R. Hunt, Professor of Mechanical Science in the Government School of Mines."

"The vast supplies of iron," it is added, "with which the collection gave evidence that the Colony is enriched, appeared to arrest the attention of all. The British miner, accustomed to follow into the bowels of the earth, beds of ore of six inches to one foot, containing between thirty and forty per cent. of this important metal, naturally regarded with surprise huge blocks of it from beds of 100 and 200 feet in thickness, and yielding 60 to 70 per cent." . . "The Canadian iron ores were examined with great care and attention by the agents of

Russia; it seemed to strike them with wonder that such prodigious resources should be found in any country but their own; and the public in general, without taking into consideration the question of its present application to profitable uses, seemed to regard the great beds of Magnetic Oxide as national magazines in which was stored up a vast amount of material indispensable to the comfort and progress of mankind, which it is always satisfactory to the inhabitants of a country to know is within their reach and control, should circumstances arise to render its application expedient or necessary."

"The specimens of gold from the Chaudière Mining Company's workings, on the Touffe des Pins, were not equalled by any in the building, with the exception of a mass, weighing eighteen pounds, from California, and with other *pepites*, less in size and fewer in number than those of the Touffe des Pins," from other Canadian localities. Mr. Logan states that an English manufacturer had, in 1852, had five tons of chromic iron sent him, per order, with a view to its introduction into the English market; and that he was "informed by one of the principal manufacturers of paints in London, that the iron ochres from Canada were of the best usual description, and equal to those now imported from France." . . . "In the Canadian collection there were no less than seven exhibitions of ochres from eight different localities, the deposits of which are important in quantity. An enterprising American, who attended the Provincial Exhibition in Montreal in 1850, immediately on observing the ochre exhibited by Mr. D. G. Labarre, from Pointe du Lac, went down to the spot and purchased the lot on which it there occurs; and I understand that he has since exported from it several hundred barrels of the ochre to the United States."

"The lithographic stones from Marmora" were also "specially noticed in the Report of the Jury, for their homogeneousness and apparent good quality, and particularly for a point of scientific interest connected with them, which is, that they belong to a formation of much older date than any lithographic

stones heretofore discovered. Researches for them have heretofore been confined to the rocks of the oolitic series, while in Canada they are found near the base of the Lower Silurian; this discovery widens the field in which many who practice lithography may look for the stone."

Such was the estimate formed of the quality of the white quartzose sandstone used for glass-making, that enquiries have since been made of Mr. Logan, on behalf of a large manufacturing house in England, as to the cost at which it could be forwarded to the United Kingdom, "large orders" being anticipated, provided the price should suit.

The Mineral Manures, especially the phosphate of lime exhibited by Dr. Wilson of Perth, are further described as having "attracted attention," as also the whetstone rock from the Eastern Townships, which "was considered of excellent quality."

None of the granites in the English Division, though including "many splendid examples from Devonshire, Aberdeen, and other places," appeared to Mr. Logan "to equal the granite of the Eastern Townships, an undressed block of which measuring upwards of a foot cube, procured from the vicinity of Stanstead, was much admired." One of the Serpentines from Brompton Lake, showing a dark green ground with black spots, is stated to have been "of a peculiarly beautiful character." He was informed by the Marble manufacturer, a highly respectable one, who cut the stone for Exhibition, "that large blocks of such a description would command a ready sale in London." (Geol. Report for 1851–52, pp. 43–53.)

Already a mass of Magnetic Iron Ore has, as reported in the Newspapers, been forwarded to Paris for the approaching Exhibition, which weighs over 2,000 lbs., with one of Specular Iron of about the same weight, and measuring six feet in length, so that it is to be hoped the standing secured in London will be maintained there.

As yet no discovery has been made of Coal in Canada. By way, however, of compensation for this fact, it is our good fortune to be so surrounded by the Coal fields of our neighbours and fellow-colonists as to make the obtaining of an unlimited supply, and that at a moderate cost, comparatively easy. In Toronto the expense of Coal brought from Ohio is little, if at all, more than half that of wood grown within a few miles of the City. "Distributed over nearly half the coast of the Gulf of St. Lawrence, from St. George's Bay, Newfoundland, to Bathurst, in the Bay of Chaleurs, Newbrunswick, the beds of coal are often seen exposed, even in cliffs that surmount the sea,—seeming to hold themselves in readiness, so to speak, for the ships that cross the Gulf. The Mines of Sidney and Pictou are celebrated even in the United States, and their Coal competes with that of Pennsylvania, Maryland, and Virginia." (Marcou, p. 37.)

"The Western District of Canada," says Mr. Logan (in a valuable article on its Physical Structure, contained in the number of the *Canadian Journal* for August, 1854, pp. 1, 2), "has, at a short distance on the north-west side of it, the Coal field of Michigan, and at a somewhat greater on the south-east, what has been called the Coal-field of Appalachia. The former, as has been ascertained by the investigations of the Geologists of the United States, occupies the chief part of the interior of the Southern Peninsula of Michigan, and has a superficies of about 12,000 square miles, while the latter, extending in length from the north-eastern corner of Pennsylvania to Tennessee, and in breadth from the vicinity of Lake Erie to the sources of the Potomac, presents the greatest known Carboniferous area on the face of the globe, its surface being equal to about 60,000 square miles."

Mineral Springs abound in Canada, some of which enjoy considerable repute on account of their medicinal qualities. Fifty-four of them have been described in the Reports of the Provincial Geologist and his associates. These Springs are divided by Mr. Hunt (in th ort for 1852, where a list of

them, which we append, is given) into two classes, namely, "the Saline and the Acid;" the Saline being arranged into two divisions. Of these divisions, the first marked A, and arranged in the order of their Saline strength, that is, according to the amount of solid matter which they afford, "includes such as contain, in addition to the alkaline chlorids, sulphates or hydrochlorates of lime and magnesia." Of the twenty-seven waters included in this group, twenty-two "contain iodids and bromids," which Mr. Hunt states he has never found absent in the proper Saline waters of the country, whose characteristic ingredient is common salt. The five at the bottom of the list are very feebly Saline, containing only "traces of chlorids, with some sulphate of lime and magnesia."

"A great number of the proper Saline waters," it is added, "contain small portions of salt of baryta and strontia; they are found in part dissolved as chlorids, and are in part thrown down as carbonates, with the precipitate of carbonates of lime and magnesia, which all of these waters afford when boiled, and which are dissolved in the recent water as bi-carbonates. The two bases, baryta and strontia, are generally, if not always, found together, and they are seldom wanting except in those waters which contain sulphates. Small quantities of carbonate of iron are generally found with the earthy carbonates, but it is in no instance in sufficient quantity to give a marked chalybeate character to the waters." "Traces of manganese" and "phosphates in small portions" are generally met with.—"When evaporated to dryness with an acid, these waters always yield a portion of silica." "Boracic acid" was detected in a water of this division from La-Baie (No. 3.), and it is probable that it may be found in many others. Though "none of waters yet examined contain that excess of carbonic acid which gives to the Seltzer and Saratoga waters their sparkling appearance and acidulous taste," "many of the Springs give off carburetted hydrogen gas, in greater or less quantities; the most remarkable instances are 5, 6, and 7 of division A, and 2 and 4 of division B."

In the following list the amount of solid matter for 1000 parts of the water is given, while in each instance reference is made to the page of the Report in which the analysis may be found, and a star (*) marks such as have been quantitively analysed. Those containing sulphates are marked with the letter S, and those in which baryta and strontia have been found, with B :—

CLASS 1st.—SALINE WATERS.

DIVISION A., CONTAINING CHLORIDS OF EARTHY BASES.

	LOCALITIES AND NAMES.		In 1000 pts.	See Report for
1	Ancaster (Salt Well).....	S	36·67	* 1848, p. 161
2	Bay St. Paul	"	20·68	1851, " 53
3	La-Baie-du-Fêbvre (Lafort's Spring).	B	15·94	1853, " 160
4	Alfred.....	B	14·50	1852, " 112
5	Caledonia ("Intermittent").....	"	14·63	* 1848, " 149
6	St. Léon	B	13·83	* 1849, " 53
7	Caxton.....	"	13·65	* 1849, " 55
8	Rivière Ouelle.....	S	13·36	1852, " 113
9	Plantagenet (La Rocque's Spring)....	"	13·16	* 1849, " 57
10	Lanoraie	B	12·88	* 1851, " 48
11	Gloucester	B	11·20	1852, " 112
12	Plantagenet (Georgian Spring).....	S	10·98	* 1851, " 47
13	Kingston	S	10·16	1852, " 117
14	Point-du-Tour.....	B	7·36	1850, " 103
15	L'Orignal (Langlois' Spring)	"	6·40	1851, " 53
16	La-Baie-du-Fêbvre (Loizeau's Spring)	B	5·44	1853, " 160
17	Ste. Anne-de-la Pocatière.....	S	5·06	1852, " 114
18	Pike River (Saline).....	B	4·76	1849, " 59
19	Ancaster (Sulphur).....;.....	S	....	1848, " 162
20	St. Benoit	S	.....	1849, " 60
21	Pike River (Sulphur).....	S	.....	1849, " 59
22	St. Eustache	S	1·88	1850, " 103
23	Les-Eboulmens (Sulphur).....	S	:70	1851, " 53
24	Fitzroy (Grant's Sulphur Spring).....	S	.....	1847, " 124
25	Pakenham Village (Sulphur Spring).	S	.....	... " ...
26	Westmeath (Petrifying Spring).....	S	.....	... " ...
27	Matan River, Gaspé.....	S	.....	... " ...

"The amount of solid matter in 19 and 20 was not determined, but their observed specific gravities were near that of 18. The proportion of the chlorids of calcium and magnesium

combined, to the entire amount of solid matter, varies greatly in the above waters; in the Ancaster Salt Well, it is equal to one-half, making the water bitter and disagreeable to the taste, like sea-water, but far more intense; those chlorids are also present in large proportion in the waters of Kingston, Bay St. Paul, and Rivière-Ouelle, and render them unpalatable. The waters from 3 to 12, that of Rivière-Ouelle excepted, are very much alike in character, and are all agreeably saline to the taste. Of the waters among these last, which have been quantitatively analyzed, the Intermittent of Caledonia will be seen to contain the largest amount of these earthy chlorids; after which follow the St. Leon and Georgian Springs; then those of Lanoraie, Caxton, and Plantagenet, which contains the least of all."

"In the second division of saline springs, these earthy chlorids are wanting, and we find instead, a portion of carbonate of soda, which gives to the waters, when concentrated, an alkaline or soapy taste. Some of these are, at the same time, strongly saline, but in others the alkali predominates, and renders the taste of salt in the evaporated waters hardly perceptible. They all afford the reactions of bromine and iodine, and many, perhaps, of all of them contain a portion of borate of soda. Carbonates of baryta and strontia are found in all those which do not contain a portion of alkaline sulphate."

CLASS 1st.—SALINE WATERS.

DIVISION B, CONTAINING CARBONATE OF SODA.

	NAMES AND LOCALITIES.		In 1000 pts.	See Report for
1	Varennes (Outer Spring).....	B	10·72	* 1849, p. 49
2	... (Inner Spring)	B	9·58	* ... " 51
3	Fitzroy (Gillans' Spring)	B	8·34	* 1851, " 49
4	Caledonia ("Gas Spring").....	S	7·77	* 1848, " 141
5	... ("Saline Spring").....	S	7·34	* ... " 143

CLASS 1ST.—SALINE WATERS. (*Continued.*)

	NAMES AND LOCALITIES.		In 1000 pts.	See Report for
6	Belocl.....	B	7·33	* 1851, " 51
7	La-Baie (Courchêne's Spring)	B	7·29	* 1853, " 161
8	Chambly (Rang-des-Quarante)	B	5·74	1852, " 116
9	Ste. Hyacinthe (Providence Spring)..	B	5·16	1850, " 102
10	La-Baie (Houlè's Spring).....	B	4·96	1853, " 161
11	Caledonia (Sulphur Spring).....	S	4·94	* 1848, " 145
12	Chambly (Grand-Côteau).....	B	2·13	* 1853, " 154
13	Ste. Martine	S	1·98	1852, " 114
14	Nicolet (Hèbert's Spring).....	S	1·56	* 1853, " 162
15	St. Ours.....	S	·53	* 1853, " 157
16	Ste. Anne-de-la-Pocatière.....	S	·36	1852, " 113
17	Jacques-Cartier River.....	S	·34	* 1853, " 159
18	Nicolet (Roy's Spring)	S	.....	... " 162

The quantity of alkaline carbonate in these springs is stated to 'bear no constant proportion to the whole amount of saline matter,' the waters of Varennes, Caledonia, Fitzroy, and Belocl containing but from ·05 to ·58 parts in 1000 parts of carbonate of soda, equal to from 1 to 12 per cent. of the whole amount of alkaline salts present, while the Jacques-Cartier spring contains 1·95, that of St. Ours ·134, that of the Grand-Coteau of Chambly 1·06, and Hébert's Spring, in Nicolet, 1·13 parts, equalling 82, 63, 52, and 72 per cent. of the whole amount of alkaline salts present. These less saline waters, then, contain not only relatively, but actually, more alkaline carbonate than the more strongly saline springs. It will be understood that a small undetermined portion of the soda represented as carbonate, exists combined with tartaric acid."

"The second class of springs consists (according to Mr. Hunt's statement), of a small number containing free sulphuric acid, together with sulphates of lime, magnesia, alumina, protoxyd of iron, and small portions of alkalies, with-

out any trace of chlorine; they all contain sulphuretted hydrogen. Of these four are known, all being in the same region of Western Canada; they are, the Tuscarora Sour Spring, containing 1·87 parts of sulphates, and 4·29 of free hydrated sulphuric acid, in 1000—(See Report for 1848, p. 152); another in Niagara, with about 0·6 parts of sulphates of the above bases, and two parts of free acid in 1000; besides a third near Chippewa, described by Dr. Mack, of St. Catherines, C.W., in the British American Journal, Vol. V., p. 63, which, in composition and strength, is very much like that of Tuscorora; and a fourth of which Mr. Hunt was informed by Dr. Chase, of St. Catherines, in the vicinity of St. Davids, and similar to the last, although weaker. (Report for 1850, p. 100.)

"All the Springs of division A, with the exception of those of Ancaster, which belong to the Niagara group, issue from Lower Silurian Rocks. The water of Ste. Anne, No. 17, comes from the Oneida Conglomorate, and the others, Nos. 3, 8, 16, 18, 21, and perhaps 6 and 14, issue from the Utica Slates of the Hudson River group; while the others belong to the Trenton limestone, or to inferior Silurian strata. Of the Springs of division B, the three of Caledonia belong to the Trenton limestone, and that of Fitzroy to the Chazy or Calciferous sand-rock, to the latter of which the water of Ste. Martine is probably to be referred. Of the remaining thirteen, Nos. 1, 2 and 17, were from the Utica Slates, and the others from the Hudson River group, with the exception of 16, which issues from the conglomerates immediately above."

Of one Spring, the Charlotteville, situated a few miles west of Simcoe, not included under either of the above classes, Mr. Hunt gives an account (in the Report for 1848, pp. 157–160) of which we shall present the substance:

"The specific gravity of the water is 1002·712; it is limped

and sparkling, its odour strongly sulphurous, and its taste pungent, with something like sweetness, leaving an impression of warmth in the mouth for some time. When mixed with a solution of chlorid of arsenic, it becomes quite opaque from the precipitation of yellow sulphuret of arsenic. A qualitative examination showed, besides, the presence of chlorids and sulphates, the latter in large quantities; the bases were potash, soda, lime, magnesia, with traces of alumina and iron; a large portion of the lime and Magnesia were not precipitated by boiling." "The amount of sulphuretted hydrogen was calculated to be ·17763 parts to 1000 by weight, or 11·6 cubic inches to 100 cubic inches of the water." The sulphur was shown, on examination, to "crust as sulphuretted hydrogen, and not as a fixed sulphuret." The amount of solid matter was calculated to be 2·49446 parts.

"The great peculiarity of this water," Mr. Hunt says, "is the unexampled quantity of sulphuretted hydrogen it contains. The strongest of the celebrated Harrowgate Springs yields but 14 cubic inches of sulphuretted hydrogen gas to the gallon, while the Charlotteville contains in the same measure 26·8 cubic inches. This, added to its saline ingredients, cannot fail," in Mr. Hunt's opinion, "to give the water great medicinal virtues." Remarkable instances, he states, were mentioned to him of the cure of "obstinate cutaneous diseases" by its external application. "When taken in doses of a pint or more, it acts as a mild aperient, but its effect seems principally determined to the skin and kidneys, acting as a sudorific and diaretic." Mr. Hunt is "not aware of any sulphurous water either in Canada or the United States which is comparable with it." "The discharge," about 16 gallons per minute, he thinks "abundantly adequate for the supply of baths;" while the location of the Spring, "in the midst of a pleasant and fertile country, and but a few miles from Lake Erie and from Port Dover," "is such as to make it easily accessible."

For medical purposes the Caladonia and Plantagenet Springs have been long in repute. In connection with the Spring at St. Catherines excellent baths have been erected, with an establishment for the accommodation of invalids, which will suffer little in comparison with the Hotels of Saratoga. Much value is put by multitudes who have made proof of it on the Tuscarora Sour Spring.

GEOGRAPHICAL FEATURES OF CANADA.

"The Province of Canada," says Mr. Andrews, "though stretching in longitude from the centre of the Continent to the shores of Labrador, and in latitude from the waters which flow into the Northern Ocean to the parallel of Pennsylvania, derives its importance not so much from great area, diversity of climate, and productions, as from Geographical and Commercial position.

From tide-water upon the St. Lawrence to Lake Superior, this Province adjoins, and even penetrates, so as to divide, one of the most commercial as well as important agricultural portions of the United States. The shortest land route between the heart of New York and Michigan is through the peninsula of Canada West, which embraces one half of the coast of the most commercial body of fresh water on the globe.

The commercial position of Canada West as a "Portage" or "Stepping Stone" between the Manufacturing and Commercial States on the Atlantic, and the Agricultural and Mineral ones of the north-west, is illustrated by the Welland Canal, the Great Western and the Ontario and Huron Railways.

Among the prominent features of Canada, her military position is worthy of notice. She is the most northern power upon this Continent; and in configuration upon the globe, she presents a triangular form, the apex of which forms the extreme

southing, and penetrates the United States; while the base is remote, and rests upon the icy regions of the North.

Flanked by the inhospitable coast of Labrador upon the East, and by the almost inaccessible territories of the Hudson's Bay Company upon the West, she can only be attacked "in front;" when, retiring into more than Scythian fastnesses on the Ottawa and the Saguenay, and keeping up communication with the strong fortress of Quebec, she can maintain prolonged and powerful resistance against foreign hostile invaders.

Viewing Canada as a whole, it may be described as a broad belt of country lying diagonally along the frontiers of the United States, from north-east to south-west, from Maine to Michigan, and between the 42nd and 49th parallels of latitude. The great River St. Lawrence presents itself conspicuously as a leading feature in its Physical Geography, traversing, in a north-easterly course, the grand valley which it drains in its mighty career to the ocean." (Report on Colonial and Lake Trade, presented in 1852 to the Senate of the United States, p. 47.)

The points which specially claim our regard in considering the country Geographically are its more elevated Lands, its Lakes, and its Rivers. All we shall attempt in relation to these will be to notice the particulars of chief interest and importance.

The waters of Canada are divided from those of the Hudson's Bay Territory by a Granite ridge, having a mean elevation above Lake Superior of about 800 feet, the surface of which is varied by granite knolls and sand-banks, rising from 150 to 200 feet above its general level. "The summit of this water-shed of the St. Lawrence basin, commencing towards Labrador coast, runs south 51° west, or about south-west half-west, at the distance of rather more than 200 miles from the water-course, until it comes opposite to that elbow of the line of the great Lakes which Erie forms; it then takes a north 51° west course, or about north-west half-west, toward the north-east end of Lake Winnipeg, and onward from thence in

the same direction to Coronation Gulf of the Arctic Sea. The angle at which the two arms of this extensive water-shed (but nowhere mountain ridge) meet between Lakes Huron and Ontario is within half a point of a right-one, and the character of the surface is everywhere the same, bearing, in the ramifications and conjunctions of its narrow valleys filled with water, no distant resemblance to the fiords of the Norway coast." (Sir John Richardson's Arctic Expedition—New York—pp. 45, 46.) The scenery of this whole tract is described as abounding in picturesque beauty, though for agriculture the country is said to be unfavourable.

The next of these ridges in elevation and importance is that which divides the waters falling into the Ottawa from those which are received by the St. Lawrence. "This ridge, pursuing a course chiefly westerly, from the division line between Upper and Lower Canada, traverses the Townships of Lochiel and Roxburgh, in the rear of Osnabruck, Williamsburgh and Matilda (in which last Township the Riviére des Petites Nâtions takes it source, at the distance of five miles from the St. Lawrence); thence, winding through Edwardsburg and Elizabeth Town, where it divides the source of one of the great branches of the Rideau, near a small Lake, from the head of Tonnewanta or Jones's Creek, at the distance of about ten miles from the St. Lawrence, the ridge traverses Bastard and Crosby, in a line extending diagonally towards the north, and divides the waters and Lake of the Rideau, from those of the Gannanoque."

Towards the St. Lawrence and the Ottawa the ridge just described "has a gradual descent of four feet one inch in a mile."

"Continuing its course westerly, this table-land divides the head waters of the Rideau from those of the Nepaunée; thence winding northerly through Olden, towards Barrie, it separates the head waters of the Mississippi from those of the Moira; and pursuing its main westerly direction, winding along the heads of numerous streams, emptying themselves into the

Trent River, and a chain of small lakes stretching towards Lake Simcoe, the westermost of which is Balsam Lake, passes about eighteen miles north of that lake. Through the Balsam Lake passes a water communication . . which penetrates through the range of high lands, and expands into two or three narrow lakes, successively up to its source near the head-waters of the Madawasca, through which chain of small lakes and four Portages, a ready communication is given from the source of the stream to Lake Balsam. At the point where this stream approaches the head-waters of the Madawasca, it is divided from them by another ridge of elevated or table-land" still higher, which, taking hence an easterly direction, joins the former near the sources of the Rideau, "dividing the head-waters of streams falling into the Ottawa from those taking the direction of Lake Huron."

Stretching in a north-west course this latter ridge meets and unites with that already described as separating the waters of Hudson's Bay from those of the great Lakes of Canada.

"From the Bay of Quinté another ridge of high lands runs in a westerly direction along the northern shores of Lake Ontario, at a distance, in some places, of not more than nine miles, . . dividing the numerous streams and head-waters of rivers falling into that lake from those descending northward into the River Trent, Rice Lake, Otonabee River, and the chain of lakes before mentioned. The ridge receding northward and westerly from the lake to the distance of twenty-four miles from Toronto, there separates the waters of Holland River and other streams falling into Lake Simcoe and Lake Huron, from those discharging themselves into Ontario. Thence, bending round the heads of the Toronto Credit, and its tributary streams, dividing them from those of the Grand or Ouse River, it pursues a south-easterly direction towards the head of the lake, merges in the Burlington Heights, and runs along the shores of Burlington Bay and the south side of Lake Ontario, at a distance not exceeding from four to eight miles, to Queenston Heights," whence it passes on in an

easterly direction, on the southern border of the lake, to Lockport in the State of New York. This ridge is supposed to have formed the shore of the original basin of Lake Ontario. (Bouchette's British America, Vol. I., pp. 70–72.)

From Grenville, on the Ottawa, another elevated range stretches in a north-easterly direction across the country, at a distance from the St. Lawrence varying from 15 to 40 miles, till it "reaches the river at Cape Tourmente, 30 miles below Quebec. From this Cape the mountainous character of the shores of the St. Lawrence may be properly said to commence, and especially to the northward, where they consist of bold and abrupt hills, rising to a general elevation of 300 and 400 feet, and in some instances attaining an altitude of 2,000. To the southward the Great Valley is bounded by a range of hills situated about the sources of the Connecticut River, and connecting to south-west with the Green Mountains in the State of Vermont, and by them with the bold range of the Alleganies, which forms the grand geological division between the waters of the Atlantic and those of the St. Lawrence. The mountains at the head of Connecticut, in their progress north-eastward, diverge into two different ramifications or spurs about the source of the St. John River: one directing its course centrally through the country, nearly parallel with the course of the St. Lawrence and the shores of the sea; the other diverging more to the north, and extending along the St. Lawrence to its mouth," at a distance from the borders of the river varying from 30 to 13 miles, but at last it "subsides on its banks, and confines the bed of the waters." "Seen from the northward it has a distinct outline, but it does not exhibit the appearance of a mountainous range when viewed from the southward, in consequence of the table elevation of the country on that side. Beyond the mountains that bound the valley of the St. Lawrence on the north, the common level of the land is marked by a considerable table elevation above the surface of the river, and is traversed by several ridges of no very conspicuous altitude till the bolder mountains rise to view,

that bound the Province to the north-west," of which we have already spoken. (Bouchette, Vol. I., pp. 185–186.)

These ranges are generally formed of eruptive and metamorphic Rocks, which makes the contour of the various hydrographic basins. Marcou classifies them as follows :

1.—*The Laurentine System.*

"The granitic, syenitic, and gneiss rocks, which make the foundation of the Laurentine Mountains, are affected with numerous dislocations that have uplifted them in different ways. These dislocations are not all of the same epoch ; nevertheless, there is one main direction which prevails much over the other directions, and is almost from east to west, with an average deviation of nearly 5°, which gives for the direction E. 5° N. and W. 5° S.

"These primitive dislocations, which form the mass of the Laurentine Mountains, have been subjected to much alteration by the crossing of the directions of subsequent dislocations, which, added to the great difficulty of exploring the country where they are found, renders the study of them not easy. The localities where this older dislocation of the Laurentine may be best observed are, the northern side of Lake Superior, between the factories of Michipicoten and the Pic ; the northern coast of Lake Huron, between French River, Lake Nipissing and Fort La Cloche, and the line which goes from Lake Simcoe a little to the north of Kingston."

The parallel lines in Missouri, Arkansas, and Texas, named by him the Ozark System, are supposed by Marcou to belong to this older system of dislocations.

2.—*Two Mountains and Montmorenci System.*

"The dislocations giving rise to this system took place," in Marcou's opinion, "at the end of the deposit of the first group of Lower Silurian ; that is, after the formation of the Potsdam group. Its direction . . . appears to be approximatively E. 40° N. and W. 40° S. The beds of the Potsdam

group are greatly elevated near the junction with the Metamorphic rocks, and are often metamorphosed themselves, which gives them a very hard quartzite aspect. The localities where this system of dislocation can be best observed are the environs of Quebec, especially between the Montmorenci and Indian Lorette Falls; Mount Calvary, in Two Mountains country, near Montreal; and Little Falls, in the State of New York." "The movement that gave rise to these dislocations was much less considerable than when the Laurentine System appeared, and was not felt at distant localities; it has only modified some parts of the preceding upheaval, by crossing and penetrating it to form small chains adjacent to this older range of mountains."

3.—*Montreal System.*

"In many localities, and especially at Montmorenci and at the Little Falls, the beds of the second group of Lower Silurian, or Trenton group, are found deposited horizontally on very much inclined strata of the Potsdam group, presenting, consequently, very discordant stratification. These beds, forming the Trenton group, have also been subjected to dislocations soon after they were deposited. Without presenting any great projections, or marks of much disturbance and upheaval, these dislocations, which took place after the deposit of the second group of Lower Silurian, are nevertheless very clearly marked, and have left very remarkable traces, especially in Lower Canada. The summit of the mountain that overlooks Montreal is formed of dykes of greenstone or Trap, which have entirely crossed the beds of the Trenton group, and are even spread over them. Several other dykes of trap, which are found in the same position on different points of the borders of the Ottawa River, as well as the Mountains of Beloeil, Rougemont, Montanville, and Johnson, near the Rivers Richelieu, Huron, and Yamaska, appear to belong to the same system of dislocation, whose general direction would be precisely from east to west. I think traces of the Montreal sys-

tem will be found in other regions, and particularly in Upper Canada and the State of New York."

4.—*Notre Dame Mountain System.*

This system Marcou holds to date "from the end of the deposition of the Lower Silurian." The "numerous strata of black Schist, distinguished in the State of New York by the name of Utica and Hudson River group," . . "which form almost entirely the banks of the River Richelieu, of the St. Lawrence lower than Montreal, and on which is situated the City of Quebec, have been upheaved along the whole of this line, to Cape Roziére at the extremity of Gaspé. The Notre Dame Mountains, formed of eruptive and metamorphic rocks, some of whose summits attain 3,500 feet, owe their origin entirely to this movement, whose general direction appears to be E. 20° N., and W. 20° S. . . The group of igneous rocks forming the Notre Dame Mountains is isolated, and entirely detached from the neighbouring groups. A line of hills of sedimentary rocks, of very slight elevation, extends between Madawaska and the River du Loup, and joins these mountains to those which are near Point Levi."

5.—*Green Mountain System.*

This system, indicated by Mr. Hitchcock under the name "Oldest Meridional and Hoosac Mountain System,"—very much developed in the western part of Massachusetts,—"forms entirely the Green Mountains in Vermont, and extends into Lower Canada as far as the river Chaudière. The general direction approaches the meridian, with a slight deviation to the east, which gives for the average N 7° E, and S 7° W." The metamorphic fossiliferous rocks found by Mr. Logan in the Lakes Memphramagog and St. Francis are held by Marcou to prove that the dislocations giving rise to this range took place "after the deposit of the Upper Silurian." At several points in Vermont, into which it extends, but especially at the River Chaudière, Canada, the Green Mountains present quartz-

ose veins traversing itacolumites, and containing native gold, which, though in some quantity, does not," this writer thinks, "appear to present sufficient richness to reward the working of it."

Marcou's sixth and seventh Systems it is unnecessary to notice. Of his eighth, (which he calls the "*Keewenau Point and Cape Blomedon System,*") the normal position is found at Point Keewenau, Isle Royale, and Thunder Cape, Lake Superior; the two parallel shores of the Bay of Fundy; Capes Split and Blomedon; and the Magdalene Islands in the Gulf of the St. Lawrence. From Mr. Logan's descriptions he conceives this system to be exhibited on the northern coast of the Bay of Chaleur, between the river Ristigouche, Richmond, and Port Daniel. Its dislocations surround immense dykes of basaltic trap, which has often flowed over them, covering the beds of the New Red Sandstone. This trap contains veins of native copper, which cross it perpendicularly, and give great value to the regions containing it—with "all the varieties of copper ore, of native silver, and many zeolitic minerals." (Pp. 67-75.)

Of the general character of the regions whose elevations—which may in some instances be properly enough designated mountain ranges—we have thus briefly sketched, notice will be taken by-and-by.

Let us now turn our attention for a short time to

THE LAKES OF CANADA.

Though these, as we shall see, are very numerous, and scattered over the whole country, the designation is applied by way of eminence to Superior, Huron, Erie, and Ontario.

As these bodies of water, vast as they are, and justly as they deserve the name of Inland Seas, so often given them, are but expansions of our magnificent St. Lawrence, on which so many eloquent eulogiums have been pronounced, it would seem but natural, before entering on their consideration, to supply, by

way of introduction, some slight notice of it; though particulars may be, perhaps, more advantageously dealt with as the regions through which it passes come under our review.

Measuring from the source of the St. Lewis River, in latitude 48° 30′ North and longitude about 93° West, the St. Lawrence has a course of 2,170 miles in length. At Cape Rozière its breadth is eighty miles, being twenty at Kamouraska, where its average depth is twelve fathoms. It is computed to discharge annually into the sea about 4,277,880,000,000 tons of fresh water, nearly half of which is held to be melted snow. (Macgregor's Commercial Statistics, Vol. V., p. 190.) Mr. McTaggart reckons its contents in cubic feet, embracing Lakes Superior, Huron, Michigan, Erie and Ontario, to be 1,547,792,360,000 (cubic feet), its superficial area amounting to 72,930 square miles, the water in which would form a cubic column of nearly 22 miles on each side. (Montgomery Martin's British Colonies, Vol. I., p. 52.) This would seem rather an under statement. Guyot (Earth and Man, p. 209) declares the River and Lakes, which he asserts can nowhere be paralleled, to "cover a surface of nearly 100,000 square miles," adding, that "it has been calculated that they contain almost one-half of all the fresh waters on the surface of our planet." According to this writer, the basin of the St. Lawrence comprises nearly a million square miles. With the aid of the St. Lawrence and Welland Canals, this stupendous river is navigable for a distance from its mouth of nearly two thousand miles, small craft being able to ascend considerably higher.

Lake Superior, the uppermost of our Inland Seas, "is comprised," (says Charles T. Jackson, M.D., late United States Geologist and Chemist, in a Paper given in Andrews' Report, pp. 232–244), "between the 46th and 49th degrees of north latitude, and the 84th and 92nd degrees of longitude, west of Greenwich. Its greatest length is 400 miles; its width in the middle is 160 miles, and its mean depth has been estimated at 900 feet. Its surface is about 600 feet above the level of the Atlantic Ocean, and its bottom is

300 feet below the level of the sea." Mr. Logan states that its greatest depth is supposed to be 1,200 feet. Taking its mean depth at 600 feet, he conceives it to contain about 4,000 cubic miles of water. According to his estimate of its size, which comes considerably short of Dr. Jackson's, its circumference is 1,500 miles, and its area 32,000 square miles. On the north side of the Lake three considerable rivers, the Kamanitiquia, the Neepigon, and the Pic, fall into the Lake, the Michipicoten and the Montreal entering it on the east side. These streams take their rise in the height of land separating the waters of Hudson Bay from those of the St. Lawrence, and vary from 100 to 200 miles in length. (Report for 1846–1847, p 7.) About forty miles from its mouth the Kamanitiquia passes through Dog Lake, which Mr. Murray describes as an extensive sheet of water, thickly studded with Islands, occupying an area probably upwards of 200 miles, and having an elevation of about 500 feet above Lake Superior, or about 1,100 feet above the level of the sea. In its course, which he represents as something more than 120 miles in length, it is precipitated, at what are called the Grand Falls, almost vertically a height of 100 feet, below which it rushes very rapidly through a deep gorge, cut through slate, to the foot of the Great Dog Portage. (Report for 1846–47, pp. 49, 50.)

Dr. Jackson, who states Lake Superior to be the largest sheet of fresh water on the face of the globe, describes it as forming the most remarkable of the great American Lakes, not only from its magnitude, but also from the picturesque scenery of its borders, and the interest and value attaching to its geological features. He pronounces it at the present moment the most valuable Mining district in North America, with the exception only of the gold deposits of California. "The whole coast of the Lake," he says, "is rock-bound; and in some places mountain masses of considerable elevation rear themselves from the immediate shore, while mural precipices and beetling crags oppose themselves" to its surges, threatening the "unfortunate mariner, who may be caught in a storm

upon a lee-shore, with almost inevitable destruction. Small coves, or boat-harbours are abundantly afforded by the myriads of indentations upon the rocky coast; and there are a few good snug harbors for vessels of moderate capacity, such as steamboats, schooners, and the like." From Lake Huron it differs, according to him, in possessing but few islands; though Mr. Logan speaks of these being common on the north shore. "The Canadian shores of Lake Superior," this gentleman says, "in general present a bold and rocky coast, diversified in the character of its scenery in accordance with the distribution of its different geological formations. Cliffs and eminences rise up to heights varying from 300 to 1,300 feet, close upon its margin, and this, deeply indented in some parts with extensive bays, and in others possessing extensive clusters of islands, is in a multitude of places carved out into well-sheltered coves and inlets, affording innumerable harbours of a safe and commodious character, destined greatly to facilitate whatever commerce may hereafter be established on the Lake, whether in the produce of its mines or its fisheries."

The trees most common in the neighbourhood are spruce, balsam fir, white birch and poplar, with cedar on most places. Hard-wood is scarce, red pine seldom seen, white pine not abundant. Though the kinds of wood required for building and fuel are sufficiently abundant, there is a want of the sorts esteemed in commerce.

Lake Superior freezes only near the shore, from which the ice very rarely extends to more than ten or fifteen miles distance. Boulders, however, native copper, and even animals, such as "squirrels, rabbits, deer, moose, cariboo and bears, are sometimes borne by its floating masses to positions which they would not otherwise have reached." The mouth of every river on the Lake shore reveals, according to Dr. Jackson, by the *debris* brought down by the ice in the spring freshets, the nature of the rocks and minerals which occur in its immediate banks or bed; and thus indicates to the explorer the proper places where to search for ores or metals.

"The frosts of winter are not," Mr. Logan states, "sufficiently long-continued to cool, nor the heat of summer to warm this great body of water to the temperature of the surrounding surface, and the lake in consequence considerably modifies the temperature of the country on its banks, which is neither so low in the one season, nor so high in the other, as it is both to the east and to the west." In the middle of the lake, on a calm day of sunshine, being the 7th of July, Mr. Logan found the temperature of the water on the surface to be only 38° Fah., and that of the atmosphere above the lake only 51°, while in the interior of the country he thinks it was probably from 70° to 80°, or more.

In the opinion of Dr. Jackson, "none of the American Lakes can compare with Lake Superior in healthiness of climate during the summer months;" and he thinks "no place so well calculated to restore the health of an invalid who has suffered from the depressing miasms of the fever-breeding soil of the south-western States."

Mr. Andrews (Report, pp. 231, 232) describes the volume of water brought down by the tributaries of Superior as affording superabundant water-power for manufactories the most extensive in the world, and pronounces the white-fish and trout of the lake to be "unequalled by any fish in the world for excellence of flavour and nutricious qualities."

Though in the immediate vicinity of the lake the country is comparatively sterile, the soil, when some distance from it is obtained, is spoken of as being good. A considerable population is thought likely to occupy it by and by, in consequence of the abundance of its minerals and its fish, and from the facilities which its position gives it for the carrying on of a large and profitable commerce. (Andrews and Jackson.)

According to Mr. Logan, the formations on both sides of Lake Superior are of a similar character. "The series on the north, in ascending order, consists of:"

"1st—Granite and Syenite; 2nd—Gneiss; 3rd—Chloritic and partially talcose and conglomerate slates; bluish slates or

slates interstratified with trap ; sandstones, limestones, indurated marls, and conglomerates interstratified with trap."

"The base of the series is a granite, frequently passing into a syenite by the addition of hornblende," which has generally mica associated with it. The mica and hornblende are generally black, "the quartz either opaque or translucent white, or colourless and transparent;" the feldspar has usually some shade of red, either pale or deep, whence the mass takes in most cases "a reddish tinge," though it occasionally assumes "a speckled aspect" in consequence of the feldspar's being green. Except where cut by granite dykes, the grain of the rocks is usually small. Occasionally the rocks present "a double system of joints, very regularly parallel for considerable sections of the coast, giving it in some degree the appearance of stratification."

"The granite appears to pass gradually into a gneiss, which seems to participate as often of a syenitic as a granitic quality." The layers, though "sometimes beautifully regular," are generally "corrugated." Usually they are made up of several minerals, with some one strongly preponderating. The feldspathic beds are sometimes many feet thick, being of precisely the same character with the massive granite beneath.

Both the gneiss and the granite are very often traversed by an ancient system of dykes or veins of a granitic character, in general large-grained, very feldspathic or quartzose, sometimes wholly the one or the other, and frequently so cutting up one another as to form a complete network on the surface.

"The gneiss is succeeded by slates of a general exterior dark-green colour, often dark-grey in fresh fractures, which at the base appear occasionally to be interstratified with beds of a feldspathic quality, of the reddish colour belonging to the subjacent granite and gneiss ; sometimes they are a combination of feldspar and quartz, occasionally with the addition of hornblende, making syenitic beds ; and in some the hornblende predominating, will give the syenite a general green

colour. Rising in the series, these become interstratified with beds of a slaty character, holding a sufficient number of pebbles of various kinds to constitute conglomerates."

Pictured surfaces are in many cases presented in consequence of the wearing down of the conglomerate slates and pebbles by the action of the water. Small opaque-white feldspathic crystals mingling with the pebbles "occasionally spot the whole rock."

At the River Doré, near Gros Cap, about five miles from the mouth of the Michipicoten, there is an exposure of these conglomerate or pebbly slates of 1,700 feet in thickness. Behind this a much larger amount of the same formation comes in, though from its being over-grown with moss and trees the detail cannot be followed out. Mr. Logan thinks it probable that it reaches several thousand feet.

"On the formations already mentioned, rest unconformably conglomerate beds, probably of no great thickness, composed of quartz pebbles chiefly, with a few of red jasper, and some of slate in a green arenaceous matrix, consisting of the same materials in a finer condition. These are followed by a set of very regular even layers of chert, sometimes approaching a chalcedony, varying in colour from nearly white, through different shades of grey, to black, and in thickness from half an inch and less, to six inches, and sometimes even a foot." Then layers of a calcareous quality, weathering rusty-red, and presenting a striking ribbon-like appearance, separate the plates from one another. "Occasional thicker calcareous beds occur, sometimes highly crystalline, separating aggregate bands of the ribbon-like strata, and these calcareous beds, as well as the chertbands, are sometimes interstratified with argillaceous layers. In the vicinity of the disturbed parts, the chert sometimes passes into chalcedony and agate, and small cracks are filled with small quantities of anthracite." Some of the chert bands appear to be made up of a multitude of minute, irregular, closely aggregated sub-globular forms, floating as it were in the siliceous matrix." Calcareous layers appear occasionally

among the Slates. Iron pyrites are also met with, with trap bands, and "highly crystallised prehnite, accompanied by calcareous spar." The overflow of this is "from 200 to 300 feet thick, and the whole associated rocks to the base of the form above may possess a volume of between 1,500 and 2,000 feet."

Reposing on the formation just described, there occurs in Thunder Bay a white sandstone, fine-grained, and apparently composed in some parts almost entirely of minute grains of quartz, having in others small rounded white grains of a calcareous quality intermingled with them.

The above beds, which have a thickness of about 200 feet, are "followed by sandstones, consisting of red and white layers interstratified with one another, and associated with conglomerate beds composed chiefly of pebbles and boulders of coarse red jasper, held in white, reddish, or greenish sand, as a matrix. The thickness of these beds, which include more calcareous matter than those below, can hardly be less than 500 feet. Limestones of a reddish-white colour and compact texture, adapted to building purposes, "interstratified with calcareous-argillaceous shales and reddish-white sandstones," succeed them, "the whole giving probably not under 80 feet, with an addition of 50 feet of reddish indurated marl at the top." Red and white sandstones, very often argillaceous, with conglomerate layers, follow these calcareous strata after an interval of which the amount is uncertain.

A "volcanic overflow," which it is supposed obtains a thickness of from 6,000 to 10,000 feet, crowns this formation. The trap, of which this overflow consists, is a "greenstone, of an amygdaloidal character, with extensive masses towards the top "of a more solid and more highly crystalline quality, sometimes passing into well-marked columnar basalt, associated with others of a vitreous aspect, exhibiting the forms of pitchstone, porphyry, and pipestone.

Calcspar, quartz in various forms, and abundant in that of agate, together with prehnite, epidote, native copper, specu-

lar iron, and various zeolites—red and white Heulaudite, stilbite, mesolite, Laumonite, and analcime—fill the cavities, which are of various sizes and shapes.

"On the surface of some of the beds, partially concentric wrinkles resulting from the flow of the volcanic matter when in a viscid condition are strongly marked." . . "From the several directions, the parallelism of the separate beds, and the character of the wrinkles, it appears probable the general surface on which the volcanic flow occurred, was not far removed from horizontality."

The formations down to the granite are traversed all along the coast by trap dykes, having, apparently, a source different from the stratified trap, which, however, they sometimes approach in character. Greenstone preponderates in the composition of these dykes, with certain porphyritic varieties described by Mr. Logan.

The green stone dykes possess "a well-marked transverse columnar structure" generally, at right angles to their plane, the size of the columns increasing with the breadth of the dyke, which sometimes obtains the measure of 200 feet. Thirteen of them of good size were counted by Mr. Logan in the width of two miles, "and their parallelism for great distances was as remarkable as their number."

In general the dykes appear "more durable than the rocks they cut," whence it results that "the destructive action of the water upon the coast is partially arrested in its progress upon meeting with them," as they run out into "long prongs or promontories, with deep recesses behind them," or present a succession of long narrow islands, which act as break-waters in defending the neighbouring mainland. It "frequently happens that a narrow breach having been effected in a dyke, it will be found to be the entrance to a spacious cove worn out on each side in the softer rock behind it. In almost all these instances, commodious harbours are the result, and it is mainly owing to the presence of these dykes, that so many such harbours exist on the Canadian side of the lake"—a possession of

very great value when we take into account the liability of this inland ocean to sudden storms through the abruptness with which the winds, in consequence of the loftiness of the crags which surround it, impinge upon the water. (Jackson.)

"In addition to the dykes," says Mr. Logan, "a vast collection of mineral veins intersect the formations of Lake Superior. A very large number of these contain a greater or smaller amount of various metalliferous ores, and the indications which they present, are such as to render it probable that some part of the country characterized by them, will sooner or later, rise into some importance as a mining region. The metals whose ores are met with, are copper, lead, zinc, and silver."

"In the upper formation, which is so much associated with amygdoloidal trap, the mineral veins vary in breadth from a few inches to four or five feet. They are in general composed of calcareous spar and quartz, entangled fragments of the wall rocks, and dark green steatite is seldom absent as one of the constituents. Laumonite, Heulandite, Prehnite, with and without Thomsonite and Stilbite," and dysclasite and datholite, are frequently met with.

The metals occurring in the mineral veins are chiefly in the form of sulphurets, with the exception of silver, which is usually found in a "native condition, even when mixed up with the ores of other metals, unless in the case of Galena, with which it is probably united as a sulphuret." The copper also, though usually occurring in the forms of "vitreous copper, variegated copper, and copper pyrites," is also, "frequently met with in a native state." It is found, also, "as a carbonate resulting from the decomposition of the other ores where acted on by the weather at the outcrop of a lode."

These metalliferous veins run, on the north shore, in courses coincident with the range of the rocks, while on Michipicoten Island their direction is transverse to them. Among the upper slates the transverse veins are the most conspicuous, and vary in breadth from a few inches to twenty feet, and more, being generally "composed of calcareous spar, heavy spar, and

amethystine quartz, with apophyllite" occasionally associated, and dark green steatite generally. In general the veins coincident with the stratification cut by these transverse ones are "rather thin." One, however, "of probably sixty feet" is met with on the northwest side of Thunder Bay.

"Mineral veins analogous to those of the upper formations are found penetrating the older rocks," the vein-stones connected with which, appear to "consist chiefly of quartz and calcareous spar, with Laumonite occasionally, the metalliferous minerals being "variegated copper, copper pyrites, galena, and blende."

In Michipicoten Island the trap attains a volume which Mr. Logan thinks does not "fall short of 12,000 feet." To the south of Montreal Island, it has a development of 3000 feet. Leach, Lizard, and Montreal Islands, as stated by Bayfield, "are composed of sandstone," which forms also, according to Foster and Whitney (Lake Superior, part second, p. 113.) almost exclusively the bed of the Lake.

On the margin of the lake, in several parts, and on the banks of some of the streams examined by the Canadian Geologists, "considerable accumulations of drifted materials were observed, consisting of clay, sand, gravel and boulders, derived from the ruin of the rocks described, and from others which did not appear *in situ.*" Some of these accumulations, which on the coast of the lake take generally "the form of a series of well defined terraces," reach the height of 300 feet above the level of the lake. On the north shore, about three miles below the Petits Ecrits, seven of them occur, which rise in all 331 feet above the lake, and 928 above the sea. (Report of 1846–47, p. 6–35; 48–57.)

The importance of Lake Superior to Canada will appear yet more manifestly, when it is added that through means of the ship canal, recently completed by our neighbours, connecting its navigation with that of the Lakes below, the whole northwest region will be opened to us; and Hudson's Bay, which is reached in fifteen days by canal from Superior, brought almost

to our door, and thereby the British possessions on the Pacific be made of more easy access. (Andrews, p. 236.)

LAKE HURON.

"This superb sheet of water lies between Lake Superior on the north-west, Lake Michigan on the south-west and west, and Lakes Erie and Ontario on the south and south-east. It is 260 miles in length, and 160 in breadth in its widest part, inclusive of the Georgian Bay, a vast expanse—almost a separate Lake." "It is said to contain 32,000 islands, principally along the northern shore and at the north-western end, varying in size from mere rocky reefs and pinnacles to large and cultivable isles. The surface of Lake Huron is elevated 596 feet above the surface of the Atlantic, and depressed 45 below that of Lake Superior, and 4 below that of Michigan. Its greatest depth is 1000 feet, near the west shore. Its mean depth is 900 feet." (Andrews, p. 228.)

"A ridge of land which, proceeding from the vicinity of the falls of Niagara, sweeps round the upper extremity of Lake Ontario, and running thence into the promontory of Cape Hurd and Cabot's Head, is represented in continuation by the Manitoulin Islands, divides Lake Huron into two parts, which may be called the south and the north. The south part constituting the great body of the Lake, with a circumference exceeding 720 lineal miles, has an area of about 14,000 square miles; the north portion is again divided into two parts, the east and the west, the former of which, called Georgian Bay, extending from Nottawasaga to Shebawenahning and the eastern extremity of the Grand Manitoulin Island, with a length of 120 miles and a breadth of 50, has an area of about 6000 square miles; while the remainder, called the North Channel, gradually narrowing as it proceeds westward, presents a surface, exclusive of the various islands with which it is studded, particularly in the eastern end, of 1700 square miles; the whole area of the water of the Lake would thus appear to

be 21,000 square miles. (Mr. Murray in Report of Geological Survey for 1847, '48, pp. 99—100.)

Mr. Murray includes St. Joseph and the La Cloche Islands under the general denomination of the Manitoulins, along with Drummond, Cockburn, Grand Manitoulin and Fitzwilliam, or Horse Shoe Islands, to which it has been usually confined.

The Grand Manitoulin is a very important and very beautiful island, having a length of eighty, and an average breadth of twenty miles. Exclusive of its numerous bays and inlets, its area cannot be less than 1600 square miles. "The forty-sixth parallel of north latitude passes through three of its most northern points, and the eighty-second and eighty-third meridians of west longitude, are about equal distances from its west and east ends." Drummond and Cockburn Islands present escarpments close on the coast of their abrupt sides, whose summits rise about 50 or 60 feet above the level of the Lake. On the Grand Manitoulin, through which they run longitudinally, these attain a height of 155 to 250, 300, and 350 feet above that level. The interior of the island is described as being well supplied with streams and lakes.

The Manitoulin Islands and their corresponding peninsular promontory are "covered with dense forests, which are frequently of the description usually indicating a rich and fertile soil. On many parts of the southern end of St. Joseph, and in the smaller islands of the Manitoulin group, but especially on the Grand Manitoulin, besides groves of stately pine, that, under more favourable circumstances, might afford a considerable supply to the lumber market, there are extensive tracts of land, almost exclusively growing maple, elm, oak, ash, birch, and basswood, of such character in point of size, as not to be surpassed by the produce of the justly celebrated hard lumber lands of Canada West." On Saint Island several small settlements have been made. Cockburn, the Grand Manitoulin, and Horse Shoe Islands constitute an Indian Reserve. "At Wequamekong, where there is a Roman Catholic Mission, the clearings are extensive, and many of the Indians have aban

doned their wandering life, and subsist on their farms," which is the case also at Manitouwaning, while at Sheguenandod, though a fine country, "the clearings are few and scattered, and the natives are more frequently to be met with in the woods or in their canoes, than in their houses or on their lands." (Report for 1847-1848, p. 103.

The greater portion of the immediate coast line on the north shore of Lake Huron, west of French River, is described by Mr. Murray as being, so far as his information extended, "generally poor and rocky, in some parts wholly destitute of vegetation, in others thickly clad with trees of stinted growth, and inconsiderable value," being chiefly such as are common to the colder and more mountainous parts of the Province, to wit, balsam, fir, spruce, red and white pines, "while birch and poplar, predominating on dry parts, with white cedars and tamarac abound on the swampy and moister ground. But while the coast line presents this uninviting appearance, the interior in many places presents a very different character, especially in the valleys of the principal streams, where there are frequently to be seen extensive flats of rich and deep soil, producing maple, oak, elm, birch, and basswood, besides occasional groves of both red and white pine of large size. Various places of this description have been cleared and cultivated by the Indians, and where such has been the case, as at Spanish River, notwithstanding the rude state of aboriginal agriculture, the crops of maize and potatoes are nearly equal in both quantity and quality to those usually seen in the more favored latitude, and under the more enlightened system of tillage in Canada West."

Mr. Logan (Report on North Shore of Lake Huron, p. 8) describes the north shore as presenting "an undulating country, rising into hills which sometimes attain the height of 400 and 700 feet above the level of the Lake." "These occasionally exhibit," he says, "rugged escarpments and naked rocky surfaces: but, in general, their summits are rather rounded, and their flanks, with the valleys separating one range from

another, are most frequently clothed with hard and soft wood, often of large growth, and of such species as are valuable in commerce; in many places giving promise of a good arable soil. Many of the slopes are gentle, and many of the valleys wide."

Five principal rivers—the Thessalon, the Mississagua, the Serpent, the Spanish River, and the White Fish—flow through the country, which appears to abound in Lakes. The reported length of the Mississagua is 120 miles, and of the Spanish River 200; the other three being supposed to be from 50 to 60 miles.

The coast westward of Spanish River, abounds, according to Mr. Murray (Report for 1847-48, p. 10), "with safe and commodious harbours among its numerous islands and inlets, which can scarcely fail to become, in the course of time, of commercial importance. To the eastward of the river, the scenery is improved by the gradual approach of a high range of picturesque hills, coming out upon the coast about four miles westward of the Hudson Bay Company's post at La Cloche," called the La Cloche Mountains, one of whose peaks was ascertained to be 482 feet above the level of the Lake. "This part of the Lake is thickly studded with islands, and the coast is much indented with extensive bays and inlets, which offer shelter and security during any storm to which the voyager may be exposed; indeed, the whole coast from Sault Ste. Marie to the French River, presents advantages with respect to harbours that cannot be surpassed; but some of those which are of the safest description when entered, are dangerous and difficult to approach from the open Lake, in consequence of the numerous reefs and sunken rocks lying concealed outside of them."

French river, which is a continuous chain of long narrow lakes, lying at small elevations the one over the other, and connected by short rapids or falls, has a length of about 61½ miles from Lake Nipissing, whose elevation is 69 feet above Lake Huron, and 647 above the level of the sea.

The older groups observed by Mr. Murray on the coast and islands of Lake Huron, which afford, in his opinion, greater advantages than are to be found elsewhere for the examination of the rocks which constitute Western Canada, are described as consisting, "firstly, of a metamorphic series, composed of granitic and syenitic rocks, in the form of gneiss, mica slate, and hornblende slate; and secondly, of a stratified series composed of quartz rock or sandstones, conglomerates, shales, and limestones, with interposed beds of greenstone." Of the fossiliferous groups following these, six formations were met with, which, in the New York nomenclature come under the following designations:—

1st. Potsdam Sandstone.
2d. Trenton Limestone.
3d. Utica Slates.
4th. Loraine Shales.
5th. Medina Sandstones.
6th. Niagara Limestones, including the Clinton Group.

On the northern shore of St. Joseph, very fine silicious sand is found, which Mr. Murray thinks suitable for glass-making. The adaptation of the Niagara limestone for building purposes has been well tested on the Welland Canal and in other parts of Canada West. The stone afforded by this group on Lake Huron is equal in quality to that of Thorold and Hamilton.

Mr. Murray regards the north shore of Lake Huron as destined sooner or later to become a mineral region of importance. The Bruce Mines, which have been wrought with very considerable success, (the ore of which is stated to be "equal to the average of the dressed ores of Cornwall,") are situated on the main shore between the French and Palladeau Islands, about ten miles west of Thessalon Point. For a minute description of everything relating to these Mines, the reader is referred to Mr. Logan's Report on the North Shore of Lake Huron, pp. 20–51.

The west side of the promontory separating Georgian Bay

from the main body of Lake Huron, resembles the south side of the great Manitoûlin in general character. From Cape Hurd to Rivière au Sable (north), the coast is low, rocky, and ragged, scantily clothed with a dwarfish growth of evergreen trees, and indented by numerous bays and creeks. At Tobermory, near Cape Hurd, and at the mouth of the Rivière au Sable, there are good harbours. For several miles south from the mouth of the Rivière au Sable sand-dunes prevail; and further on, a beach of sand, strewed over in parts with boulders, extends some distance beyond the Saugeen. As the mouth of the Saugeen is approached, "evident improvement in the nature of the soil is indicated by the more frequently recurring presence of good-sized pines, accompanied with maple, elm, and birch." The mouth of the Saugeen affords a good harbour for small craft, though, in consequence of a bar which stretches across it, the entering of it is difficult under a strong wind between south-west and north. Between Saugeen and Little Pine River, the land is low. Beyond that, it "becomes more elevated, and the character of its forest proclaims a still further improvement in the soil." From Point Clarke to Point Franklin, in the Township of Stephen, a distance of fifty miles, the coast presents generally "steep and lofty cliffs of clay, the summit of which spreads back into an extensive level country, producing a luxuriant vegetation of the heaviest description of hardwood trees." Sand Dunes again prevail from Point Frank to near Cape Innerwash, fifteen miles distant, whence a fine sandy beach, with high cliffs of clay rising at a short distance back, hold the coast to near the entrance of the St. Clair river. Goderich and the mouth of the Rivière au Sable (south) afford good harbours, and small boats can enter at Big Pine Brook. (Mr. Murray in Report for 1838-39, pp. 8-10.)

The rocks exhibited on the portion of the coast just described, are, in ascending order, the following, according to the New York nomenclature:—

1. Trenton Limestone.
2. Utica Slate.

3. Loraine Shale.
4. Medina Sandstone and Marl.
5. Niagara Limestone.
6. Onondaga Group, or Gypsiferous Limestone and Shale.
7. Corniferous Limestone.
8. Hamilton Group.

The Trenton Limestone "occupies the whole of the Peninsula between Matchedash and Nottawasaga Bays, and the group of islands lying off its extremity, consisting of the Giant's Tomb, Hope, Beckwith, and Christian Islands;" and has a transverse breadth of thirty miles, with an estimated thickness of from 600 to 700 feet.

The Loraine Shale is conceived to have a breadth of about 20 miles at Owen Sound, with a thickness of about 600 feet. Stones fit for building, roofing, and flagging, with limestone and clay, are found in connection with it.

In addition to a number of places along the coast or in its neighbourhood between Colpoy's Bay and Sydenham, rocks belonging to the upper part of the Niagara limestones or the base of the Medina sandstone are seen at Galt, and beds belonging to the Niagara group on the road between Galt and Dundas.

The Niagara group is fruitful in excellent materials for building and lime-burning. White limestone of a beautiful and enduring character abounds at Galt, where blocks of almost any required size may be easily obtained. Two miles south-east from Sydenham, Owen's Sound, a white or pale grey limestone is found, well-fitted for building, and capable of being quarried almost to a boundless extent. Materials of much the same sort may be found all the way to Cabot's Head. The Rivière au Sable (South), Chief's Point, Lyell Island and the Fishing Islands, nearly the whole coast, indeed, to Cape Hurd, yield limestone of various character which might be used in building.

There are exposures of gypsiferous and corniferous limestones about seven miles west from the Saugeen River, near

Cape Douglas, where the line between the Townships of Ashfield and Colborne meets the Lake; and also on the Maitland River, near Goderich.

The corniferous Limestone exists over the greater proportion of all the western parts of the Peninsula between Lakes Huron and Erie, though covered up throughout much of its area by thick deposits of Drift. At the mouth of the Saugeen it has a thickness supposed to be about 300 feet. Gypsum and Hydraulic Lime are met with at various points in connection with this formation.

A great accumulation of Drift was observed by Mr. Murray on the margin of the Lake and on the banks of the Rivers south of the Rivière au Sable (North), consisting of clay, gravel, sand, and boulders. From the coast these accumulations extend into the interior, and cover the greater part of the country between Lakes Erie and Huron. The clay in the cliffs overlooking the latter, was found to be very calcareous, containing sometimes so much as 30 per cent. of carbonate of lime, and constituting a rich marl, which would be of advantageous application, in an agricultural point of view, to the sandy portions of the district. Fossils peculiar to the carniferous formation were found in pebbles, boulders of limestone, quartz, granite and allied species occurring in the drift, especially in the Township of Plympton. (Report for 1848–1849, pp. 8–27.)

In relation to the country on the Spanish River, which joins Lake Huron in Lat. 46° 12′ N., Long. 82° 27′ W., the following statement is made (p. 35th of above Report): "The extent and value of the pine forests in this region, the facility offered by the river for navigation, the water-power to be found on the main stream and all its tributaries, and the capabilities of the soil for raising most of the necessaries of life, all tend to indicate a probability that it is destined at some future period to become of commercial importance to the Province."

The rocks of the above region are stated to be—

1. A Granitic or Metamorphic Group; and
2. A Quartz-rock Group.

The Wallace Mine, the Ore of which was ascertained on analysis by Mr. Hunt to contain 68·6 per cent. of metallic iron, is situated about a mile west from the entrance to the White Fish River (Report, pp. 42–45.)

Mr. Murray describes the coast of the Georgian Bay as consisting, in the parts visited by him, "almost exclusively of granitic or syenitic gneiss, intersected by numerous dykes of trap and veins of white quartz." He holds the rocks, which he represents as very much contorted, to belong to the formation met with on the Rivers Ottawa and Matawa. Harbors present themselves, he says, in abundance for all sizes of vessels, though their entrance is attended with difficulty in consequence of reefs and sunken rocks. (Ibid, 54–46.)

Lake Huron has an outlet by the Straits of Mackinaw into Lake Michigan, through which it communicates, *via* Green Bay and Lake Winnebago, the Fox, and Wisconsin Rivers, with the Mississippi and the Gulf of Mexico. With the Atlantic it is connected through means of the Ontario, Huron, and Simcoe Railroad, and the river St. Lawrence; as also by the Great Western.

LAKE ST. CLAIR.

This Lake, which forms the connecting link, by means of the St. Clair and Detroit Rivers, between Lakes Huron and Erie, is twenty miles in length by 30 in width, with an average depth of twenty feet. On the Canadian side it receives the Thames River, with some smaller streams, the principal of which is the Chenoil Ecarté. At the upper end it is filled with many large low islands, some of which bear such trees as love the waters, while others are mere flats, covered with wild meadows, whose sole production is rank grass. (Andrews, pp. 227, 228.)

LAKE ERIE.

This Lake is situated between 41° 22′ and 42° 52′ N. latitude, and 78° 55′ and 83° 23′ W. longitude. It is elliptical in shape; and has a length of about 265 miles, with an average breadth of 50, and a mean depth of 120 feet. Its elevation above tide-water is 565 feet—322 above Lake Ontario, and 52 below Huron and Michigan. Being the shallowest, it is of consequence the most easily frozen of all the great Lakes.

With regard to the soil, charaeter, and commercial advantages of the countries circumjacent to its waters, Lake Erie is "singularly well situated;"—"having at its eastern and and south-eastern extremity the fertile and populous plains of Western New-York; west of this, on the southern shore, a portion of Pennsylvania, and thence to the River Maomee, at the western extremity of the Lake, the whole coast—productive almost beyond comparison—of Ohio, containing the beautiful and wealthy cities of Cleavland, Sandusky, and Toledo. On the west it is bounded by a portion of the State of Michigan, and on the north by the southern shore of the rich and highly-cultivated peninsula of Canada West,—undoubtedly the wealthiest and best-farmed district of the Canadian Province, and settled by an energetic, industrious, and an intelligent population." (Andrews, p. 225.)

The whole country around Lake Erie is described by Andrews as being "level, or very slightly rolling, with a deep, rich alluvial soil, covered in its natural state with superb forests of oak, maple, hickory, black walnut, and in certain regions pine; and producing under cultivation magnificent crops of wheat, corn, barley, and oats, besides feeding annually vast multitudes of swine and beef-cattle for the Eastern, Provincial, and Transatlantic marts. No equal amount of land, perhaps, on the face of the globe, contains fewer sterile or marshy tracts, or more soil capable of high cultivation and great productiveness, than this region."

With slight exception, this description will, we conceive, be admitted to be as applicable to the Canadian side of the Lake (which is, indeed, included in it) as to the American.

The Islands of Lake Erie are few. On the Canada side it is entered by the Grand River, a stream of considerable volume, marked in many parts of its course by great beauty, possessing fine water power, and having at its mouth the Harbour of Port Maitland, pronounced by Andrews to be "probably the best on the whole Lake."

Lake Erie receives through the Detroit,—a wide, deep, and rapid river, with a descent of 52 feet in some sixty miles,—the accumulated waters of the Upper Lakes, which it pours, through the Niagara, into Ontario. With this Lake it is connected for purposes of navigation by the Welland Canal, a noble work on the Canadian side, having a descent of 334 feet, effected by means of 37 Locks, and passable from Lake to Lake by vessels of 134 feet over all, 26 feet beam, and 9 feet draught, stowing 3,000 barrels under deck.

"By means of this fine improvement," Andrews says, "it has free egress to Lake Ontario, and thence to the St. Lawrence; and by the various improvements of that river and communications from Ontario and Champlain, to many points . . on the Atlantic sea-board."

Lake Erie likewise communicates with the Atlantic by the Erie Canal and Hudson River; with Pittsburg and Cincinnati by the Erie and Beaver Canal; and with the Ohio River at several points, by the Ohio, Erie, and Maine and Wabash Canals. A multitude of Railways, among which are the Brantford and Buffalo and the Great Western, connect it by land with the best portions of the United States, and Canada West. (Andrews, pp. 225–227.)

The bed of Lake Erie, with much of its northern margin, is formed of the Corniferous Sandstone, one of the upper members of the Silurian rocks. (Richardson's Arctic Expedition, p. 350.)

Of the peninsula bounded by Lakes Huron, St. Clair, and Erie, Mr. Murray declares that, "as an agricultural country, it may be said to equal, if not surpass, in its capabilities of soil and climate, any part of the British North American Provinces, as the rapidity with which it has been settled, the annual increase of its productions, and the growth of its numerous towns and villages, abundantly testify." "The exceeding fertility," he adds, "of portions still wild and unsettled, as shown by the size and kind of their spontaneous growth of timber in the Townships of Collingwood, Euphrasia, Artemesia, St. Vincent, Sydenham, and others, destines them to become within a short time of great agricultural importance,"—an anticipation which is being rapidly realised. (Report for 1850–51, p. 14.)

According to Mr. Murray, the Rock formations in the Western Peninsula, in ascending order, are—

1. Niagara Group.
2. Gypsiferous Strata and Limestones.
3. Corniferous Limestones.
4. Hamilton Shales.

A vertical section of the Niagara group is exhibited at the Falls on Spencer Creek in Flamborough West, having a thickness of 113 feet, to wit—

Bituminous Limestones and Shales.....	55 feet.
Cherty Limestones.....	15 "
Thick-bedded blue and grey Limestones....	25 "
Argillaceous and Arenaceous Shales.....	6 "
Massive Limestones, from the top of the five-feet band to the foot of the Falls.....	12 "
	113 "

The rocks of these sections are stated to form frequently "two separate and distinct terraces—the lower and more decidedly-marked escarpment exposing more or less of the strata below the cherty Limestone bands, which cap the precipices at

Flamborough West, and on the opposite side of the valley of the Desjardin, near Hamilton; while the Upper escarpment composed of the bituminous Limestones and Shales, rises more gradually in a succession of steps." The lower terrace was traced through Nelson, Nassagaweya, Esquesing, Chinguacousy, Caledon, Albion, Mono, Mulmer, Melancthon, Nottawasaga, Osprey, Collingwood, Euphrasia, into Artemesia, back to St. Vincent, and thence to the Owen Sound road, about a mile and a quarter from the Lake shore, near the village of Sydenham. All the way from Flamborough West to Mono the Sandstone or grey band was seen at intervals, "varying in thickness from ten to twenty feet, but preserving a pretty uniform lithological character, and indications of its presence were observed in the Township of Nottawasaga." Wherever observed it is "a whitish or pale grey, fine, granular rock, some times striped or spotted with ferruginous stains; it is always well adapted for building purposes, and, in many instances, is a very beautiful and easily-worked material. It has long been extensively quarried near Hamilton and at Waterdown, in the Township of Flamboro' East, and is equally capable of being worked nearly all the way along its out-crop, to the Township of Mono."

Massive beds of encrinal Limestone, which appear in the first of the sections above noticed, "hold crest of the lower escarpment, north of Flamboro' East, and appear to attain a gradual increase in thickness, advancing to the northward." In Nassagaweya, "there is a vertical precipice of Limestone, varying from eight to a hundred feet in height," and in Eramosa "a branch of the River Speed runs between vertical and solid calcareous cliffs of sixty to eighty feet, where divisional planes of stratification appear to be absent; the Credit in Caledonia is flanked by similar cliffs in many places, fully a hundred feet in height, which, ascending the valley, meet, and form a crescent-shaped precipice, over which the river is precipitated in a cascade." In the valley of the Nottawa the same character prevails. Similar cliffs are also observed in

Mulmur and Nottawasaga, and in the valley of the Beaver River, in Euphrasia and Artemesia, where the Limestone is at least 120 feet thick.

At the base of this Limestone huge caverns are found,—one on the Speed in Eramosa, extending between thirty and forty yards under the cliff, with about the same width at the mouth, where it has a roof five or six feet high, studded, in common with the floor, with small stalactitic incrustations.

The encrinal Limestones are described as being everywhere qualified to make a durable and handsome building stone; capable, in some parts, of being used as a marble for common ornamental purposes; and of good quality for burning into lime.

The bituminous Limestones and Shales which constitute the upper terrace, occupy a breadth of country, varying from eighteen to twenty or twenty-two miles.

Shales and Limestones with which workable Gypsum is found associated are described as occurring on the banks of the Grand River, nearly all the way from Dunville to some distance above Paris. It is stated by a gentleman of intelligence, who is also distinguished as a practical farmer, that, besides obtaining improved supplies from the old mines near Paris, new ones have been discovered, since the time of Mr. Murray's Report, far surpassing in extent and value any before found in Canada—the Gypsum rock being from six to seven feet thick, with about 200 feet wide, and dipping at a small angle to the S.E."

The fossiliferous Limestone at the base of this formation is generally well adapted for building and lime-burning, for both of which purposes it is "largely quarried at Galt, Guelph, Elora, and Fergus." At Saint Douglas, on Lake Huron; and on the Grand River, below Paris, beds of hydraulic lime are occasionally found associated with the Shales and Limestones of the upper part of the group.

From Port Dover exposures of the corniferous formation

"occur at intervals along the coast, easterly, to the termination of the Lake at Fort Erie, and are usually very fossiliferous."

Hamilton Shales present themselves at several points on the bed of the Sydenham.

The Drift which conceals the older strata in many parts of Western Canada specially abounds in the Peninsula between the Niagara Bridge and the St. Clair River. "The lower portion of the more recent deposits as exhibited on the shore of Lake Erie, where the cliffs are in many parts over 150 feet high, is a blue calcareous clay, frequently holding pebbles and small boulders of limestone, and small rounded fragments of granite or gneissoid rock. Clay of an ash-grey colour when dried, but presenting a light-brownish colour in the bed, succeeds the blue-clay, and this again is overlaid by pale buff and occasionally yellowish tinged clay. Back from the Lakes these clays are capped with a stratum of sand, and the more elevated parts present beds of calcareous gravel."

Brick clays, bog iron ore, shell marl, calcareous tufa, and peat are the economic materials of chief importance connected with this Drift.

Fresh-water shell marle were observed at several places in the Townships of Bentinck and Brant, usually concealed by a rich black vegetable mould, or peat.

Springs of Petroleum, called usually *oil springs*, rise in the River Thames, (near its right bank in Mosa), the bituminous oil, collected on cloths from the surface of which, is "used in the neighbourhood as a remedy for cuts and cutaneous diseases in horses. Similar springs exist in the Township of Enniskillen, where a deposit of mineral pitch or mineral caoutchouc is said to extend over several acres on the seventeenth lot of the second concession. (Report for 1850–51, pp. 14–33.)

NIAGARA RIVER AND FALLS.

The Niagara River, which connects Lakes Erie and Ontario, is about 35 miles in length, and has an average width of three quarters of a mile, with an average depth of forty feet. At the point where it issues from Lake Erie—the north-east extremity—its banks are low; and, being from one to three miles broad, it looks like a prolongation of the lake, being interspersed with low wooded islands. "This lake-like scenery continues," says Sir Charles Lyell, "for about fifteen miles, during which the fall of the River scarcely exceeds as many feet, but on reaching the rapids, it descends over a Limestone bed about 150 feet in less than a mile, and is then thrown down about 165 feet perpendicularly at the Falls. The deep narrow chasm below the great cataract is from 200 to 400 yards wide, and 300 feet deep; and here in seven miles the river descends 100 feet, at the end of which it emerges from the gorge into the open and flat country, so nearly on a level with Lake Ontario that there is only a fall of about four feet in the seven additional miles which intervene between Queenston and the Lake. The great ravine is winding, and makes a turn at right angles to itself at the Whirlpool, where the Niagara sweeps round a large circular basin." "At some points the boundary cliffs are undermined on one side by the impetuous stream, but there is usually a talus at the base of the precipice, supporting a very ornamental fringe of trees." (Travels in North America in 1840–42 : New York, 1845, Vol. I., p. 25.)

There are two Falls, the Horse-shoe on the Canadian side, —which is about 1,900 feet across,—and the American, 920 feet in width. This division is occasioned by an island of considerable size—formerly called Goat, now Iris Island,—which is situated just above the Falls, towards the American side.

The quantity of water poured over the Falls has been estimated at 2,400 millions of tons per day=100 millions per

hour. Mr. Barret makes it 19,500,000 cubic feet, or nearly 600,000 tons per minute. (*Canadian Journal* for Jan., 1854 p. 129.) We extract from Montgomery Martin's British Colonies, (Vol. I., p. 75,) the following calculation given by him as made at Queenston :—"The River is here half a mile broad; it averages 25 feet deep; current three miles an hour; in one hour it will discharge a column of water 3 miles long, half a mile wide, and 25 feet deep, containing 1,111,440,000 cubic feet, being 18,524 cubic feet, or 113,510,000 *gallons* of water each minute."

Behind the cataract, a little above the basin into which the precipitated river falls, there is a cavern of about 150 feet in height, 50 in breadth, and 300 in length, which may be entered as far as 30 feet. As, however, the feat is attended with danger in consequence of the narrowness of the path and the gusts of wind which meet the intruder, and dashing spray and water in his face, the aid of a guide is essential,—as "if he turns round to recover, the blast often changes in an instant, and blows as impetuously against him in the opposite direction." (Lyell, Vol. II., p. 76.)

Colonel Bouchette remarks, that "according to the altitude of the sun, and the situation of the spectator, a distinct and bright Iris is seen amidst the revolving columns of mist that soar from the foaming chasm, and shroud the broad front of the gigantic flood; both arches of the bow are seldom entirely elicited, but the interior segment is perfect, and its prismatic hues are extremely glowing and vivid; the fragments of a plurality of rainbows are sometimes to be seen in various parts of the misty curtain. (Mont. Martin, p. 75.)

In consequence of the pre-conceived notions which they bring with them, parties are sometimes disappointed on the first view of the Falls. When, however, they have fairly divested their minds of these the surprising sublimity of the scene is appreciated.

From the appearance presented by the River at Queenston, it is a common belief that the Falls were once there, and that

they have receded, through the constant wearing of the rock, to their present position, which is seven miles higher up. In this opinion Sir Charles Lyell seems to concur, for reasons which he states at considerable length in the work already quoted. (Vol. I., pp. 25–41.)

In Goat Island shells of the following genera were collected by Sir Charles—*Unio*, *Cyclas*, *Melania*, *Valvata*, *Limnea*, *Planorbis*, and *Helix*, all of recent species, in the superficial deposit, where they form regular beds, numerous individuals of the *Unio* and *Clyclas* having both their valves united.

Of the celebrated "burning spring" at the edge of the river, above the rapids, "where carburetted hydrogen, or, in the modern chemical phraseology, a light hydro-carbon . . rises from beneath the water under the limestone rock," we have the following account: "The bituminous matter supplying this gas is probably of animal origin, as this limestone is full of marine mollusca, crustacia, and corals, without vegetable remains, unless some fucoids may have decomposed in the same strata. The invisible gas makes its way in countless bubbles through the clear transparent waters of the Niagara. On the application of a lighted candle it takes fire, and plays about with a lambent flickering flame, which seldom touches the water, the gas being at first too pure to be inflammable, and only obtaining sufficient oxygen after mingling with the atmosphere at the height of several inches above the surface of the stream." (Ibid., 75, 76.)

LAKE ONTARIO.

"This Lake is 180 miles in length, by 40 in average width; its mean depth is 500 feet, its height above the sea 232, and its area 6,300 square miles; its principal affluent is the outlet of the superfluous waters of all the great upper Lakes, by the Niagara Falls and River."

"Its only tributaries of any consequence are—from the Ca-

nadian side, the Trent and Credit; and from the State of New York, the Black River, the Oswego, and the Genesee. Its natural outlet is by the channel of the St. Lawrence, through the Thousand Isles, and down a steep descent, broken by many rapids and chutes, to Montreal; and thence without further difficulty to the Ocean." (Andrews, p. 224.)

The country on both sides of Lake Ontario is productive and well-settled. With Lake Erie it is connected by the Welland Canal; and with the Gulf of St. Lawrence by the Lachine, Beauharnois, Cornwall, and Williamsburg Canals, constructed to admit the large Lake Steamboats plying between Montreal, Ogdensburg, Kingston, Toronto, and Hamilton. Besides these, it has on the American side, the Oswego Canal, falling into the Erie Canal at Syracuse; and the Ogdensburg and the Oswego and Syracuse Railways, uniting with the Albany and Buffalo, Great Western, Hudson River, and Vermont system of Railways,—having ramifications through all the New England States, and opening up to it free access to all the more important harbours on the Atlantic." In a short time there will be to be added to these a multitude of Railways now in progress or contemplated on the Canadian side,—among them the Grand Trunk, which will extend along its whole length, and many hundred miles below. Besides these direct outlets, it "possesses of course incidentally all those opening from Lake Champlain."

"If," says Prof. Croft (in an article on the Mineral Springs of Canada in the *Canadian Journal* for Feb., 1853), "we cannot congratulate ourselves on the possession of very strong mineral springs, we at least are extremely fortunate in possessing lake and river water of a greater degree of purity than almost any other part of the world. The water of Ontario is of most extraordinary purity, and it is very probable that the waters of the upper lakes will be found to be still more free from extraneous matters." . . "The water of some of the rivers of Canada seems," the learned Professor adds, "to be exceedingly pure. The St. Lawrence water at Montreal has been ana-

lysed by Dr. Hall ; and from some experiments which I have recently made on the Thames water (London, C.W.), it appears that the quantity of solid ingredients in one imperial gallon of 70,000 grains amounts to only 10·50, a purity which is equalled by only a few other waters in the world."

These Lakes abound in fish of various kinds, and of the best quality. A considerable trade, capable of large increase, is carried on, especially on Superior and Huron, in salting them for the markets of the interior. (Foster & Whitney's Lake Superior, Vol. II., p. 395.)

Ontario is free comparatively from the storms to which the other lakes are more or less liable.

For an interesting notice of certain *sudden* disturbances of level to which some of the Lakes are subject, which Professor Hind attributes to the "sudden liberation of pent up gasses, resulting from the decomposition of the carbonaceous accumulations which characterise the Utica Slate, (ascribed by some to volcanic action,) the reader is referred to the *Canadian Journal* for June, 1854, and October, 1853.

In the same excellent Journal he will find a double series of articles, (one by the learned Editor, and the other by Major Lachlan,) on certain *periodic* variations of level in the Lakes, which will well repay his attention.

From an elaborate exhibition and comparison of facts and opinions relating to this topic by Charles Whittlesey, Esq., (given in Foster and Whitney's Lake Superior, Pt. II., pp. 319–339,) we select the following extracts, embodying the conclusions to which that gentleman has been led:—

"A comparison of the rise and fall of the water of the Lake (Erie), with the recorded observations of the rain-gauge, will show conclusively that the surface of these great bodies of water rise gradually after an unusually large amount of rain has been falling during one or more seasons, and that, on the other hand, they fall after a long period during which the quantity of rain has been less than the average; obeying in

this respect the same laws which influence other collections of water."

"The different Lakes do not rise and fall at the same time, but in succession; as the several mill-ponds on a stream are known to fill, during floods, in order—beginning with those nearest the source—and to discharge themselves in the same order. The successive basins of the Lakes are so many ponds or enlargements of the St. Lawrence. There is, besides, an annual rise and fall which is not equal in different years, and not precisely uniform over the whole area, during the same season."

"The annual tide takes place, whether the lake be low or high, and is at its flood in the spring, after the rains of that season and the snows of winter, melted by the warm weather, have united in throwing a surplus of water into all the lakes. In the fall and winter—when the meteorological conditions are reversed, and the absence of rain and the presence of frost unite to check the discharge of water from the tributaries—the lakes, as might be expected, recede twelve, fifteen, and even eighteen inches."

"Instead of regarding the rise and fall of water in the lakes as a mystery, it is rather to be wondered at that there is so little fluctuation. Their stability is dependent entirely upon the regularity of the seasons, within the lake country, and if there should be a combination of wet and cold years, wherein the fall of rain should be great, and the evaporation small, there might be a rise or fall exceeding anything we have on record."

"There are many circumstances to be considered, such as the unequal amount of water received and discharged by each lake; the different winds, and the opposite effect of the same wind blowing over the different lakes; so that it is evident there must be undulations of level and accumulations of water at one point, for days or weeks together. A south-west wind sweeping over Lakes Michigan, Huron, and Erie operates quite differently upon their surfaces. While it accelerates the dis-

charge of the water from Lake Erie, and lowers the surface of that lake at its western end, it checks at the same time the flow from Lake Huron; thus operating in a two-fold manner to depress its surface. A north-east gale, on the other hand, forces back the water of Lake Erie and increases the discharge of Lake Huron, so that there is a corresponding rise of the waters at the western extremity of the former lake. Neither do all the lakes reach their maximum height at the same time, but successively, according to the combined action of the various meteorological causes."

"In general, the great lakes rise and fall nearly together; but not absolutely at the same time, nor by an equal amount."

"It is apparent from these statistics, (those, to wit, given in the article whence we quote,) that there is no foundation for the popular belief that there is a rise and fall of the lakes during a period of fourteen years. Between 1796–8 and 1819–20, a period of twenty years, there was a gradual depression and rising of the lakes. From 1816 to 1819–20, the waters fell to a lower level than even their previous stage of depression. From 1819–20 to 1838, a period of eighteen years, there was a steady increase of elevation, when the water attained its greatest known height. The lowest stage of water, since that time, occurred in October, 1841, which was less than three and a half years after the preceding great depression."

"No person, who examines the daily registers, will find any grounds for the belief that there is in Lake Erie a daily or lunar tide, like that of the ocean."

"The causes which produce changes in the levels of the lakes are the same as those which influence other collections of water; that is, the ever-varying amount of rain and evaporation."

Encroachments are, of course, made by the lakes on the land in particular places, while there is in other parts an apparent recession from ground previously occupied.

Of Lake Michigan no notice has been taken above as it does

not come within the class of Canadian waters. Its connection, however, with these induces me to give here the following particulars:

In size Michigan is the second of the great lakes; being 360 miles long, by 60 in average width; having a mean depth of 900 feet, and comprising an area of 16,981 square miles. It lies between 41° 58′ and 46° north latitude, and 84° 40′ and 87° 8′ west longitude. "On its western shore it has the great indentation of Green Bay—itself equal to the largest European lakes, being a hundred miles in length, by thirty in breadth, well sheltered at its mouth by the Traverse Islands, and having for its principal affluent the outlet of Lake Winnebago and the Fox River."

"The other principal tributaries of Lake Michigan are the Manistee, Maskegon, Grand Kalamazoo, and St. Joseph Rivers, from the southern Peninsula of Michigan; the Des Plaines, O'Plaines, and Chicago Rivers, from Indiana and Illinois; and from the northern Peninsula of Michigan, the Menomone Escanaba, Noquet, Whitefish, and Manistee Rivers."

"The lake is bounded to the eastward by the rich and fertile lands of the southern Peninsula of Michigan—sending out vast supplies of all the cereal grains, wheat and maze especially—equal if not superior in quality to any raised in the United States; on the south-west, by Indiana and Illinois—supplying corn and beef of the finest quality, in superabundance; on the west by the productive grain and grazing lands and lumbering districts of Wisconsin; and on the north-east and north by the invaluable and not yet half-explored mineral districts of Northern Michigan."

"The natural outlet of its commerce, as of its waters, is by the Straits of Mackinac into Lake Huron, and thence by the St. Clair River down the St. Lawrence, or any of the internal improvements of the lower lakes and the States hereinbefore described."

"Of internal communications it already possesses many, both by Canal, and Railroad, equal to those of almost any of the

older States, in length and availability, and inferior to none in importance."

"By the strong, deep, and rapid River of St. Mary's, with its broad and foaming sault, Lakes Michigan and Huron are connected with what may be called the head-most of the great Lakes, though itself the recipient of the waters of a line of lakes extending hundreds of miles further to the north-westward, though unnavigable except to the canoes of the savage." (Andrews, pp. 129–131.)

"Taking into account only the central and upper divisions of the St. Lawrence valley, from Niagara to the north-west angle of Lake Superior, embracing all the country whose streams are tributary to the lakes, the surface drained is calculated (as shown by a table of calculations) at 248,775 square miles, besides 86,760 square miles occupied by the lakes; and it is further calculated that the enormous accumulation of water discharged through the Detroit River during high floods, allowing a current of only one mile an hour, is not less than 95,135,000 cubic feet per hour, or 1,588,558 cubic feet per minute." (Major Lachlan in Canadian Journal for July, 1854, p. 300.)

We know not how better to conclude our account of the lakes than in the following language of Mr. Andrews, which, with the exception of the word *coal* (in relation to which we would have the remarks already made borne in mind), applies with equal force to Canada as to the United States:

"This is a brief and rapid outline of a country, and a system of waters, strangely adapted by the hand of Providence to become the channel of an inland navigation, unequalled and incomparable the world over, through regions the richest of the whole earth in productions of all kinds,—productions of the field, productions of the forest, productions of the waters, productions of the bowels of the earth,—regions overflowing with cereal and animal wealth, abounding in the most truly valuable, if not most precious, metals and minerals—lead, iron, copper, coal—beyond the most favoured countries of the globe;

regions which would, but for these waters, have been as inaccessible as the *Steppes* of Tartary or Siberia, and the value of the productions whereof must have been swallowed up in the expense of their transportation." (Report, p. 244.)

COUNTRY

North of Lake Ontario, between Kingston and Lake Simcoe, formerly Midland, Victoria, and Newcastle Districts.

One of the most marked characteristics of this region is the multitude of Lakes, mostly small, though some are of considerable size, with which it is dotted over. For an interesting description of these—including their elevations and connections—the reader is referred to the Geological Report for 1852–1853.

The Rocks of the area within which these numerous lakes are found, "belong to two distinctly different periods; one set being fossiliferous and nearly undisturbed, and the other unfossiliferous and greatly disturbed, contorted, and altered. By drawing a straight line from the middle part of Loughboro' Lake, across the heads of Knowlton and Beaver Lakes, to Round Lake in Belmont, . . and then another from Round Lake to the northern extremity of Balsam Lake, a tolerably fair representation of the junction of the two series of rocks will be indicated; the Metamorphic or Laurentine series keeping on the north, and the fossiliferous on the south side of the lines.

A large area of the more southern portion of the region under review, is "spread over with deposits consisting of clay, sand, gravel, and boulders;" but their origin cannot easily be determined, in consequence of the absence of organic remains.

Beds of the above description are met with, among other places, at Belleville and Cobourg.

Gravel Drift was found by Mr. Murray on Burlington

Heights, somewhat to the west of the area under notice, sixty feet above the level of Lake Ontario, where fossil bones were exhumed, while a cut was being made for the Great Western Railroad, which have been pronounced, on comparison with Professor Owen's work on Comparative Anatomy, to belong to the extinct species of elephant, *Elephas primigenius*, or Mammoth.

"The gravel drift of Burlington Heights has evidently at one time formed a bar or spit at the mouth of an estuary of a river flowing from the west. It extends in a narrow ridge from the Desjardins Canal under Flamborough Heights, to the Heights opposite in Barton, having a great marsh to the westward, called the Dundas Marsh, west of which the valley is all clay." . . "The bar across the mouth of Burlington Bay, extending across from Wellington Square to Stoney Creek, in Saltfleet, affords a good modern illustration of what Burlington Heights were, when the relation of land and water in the vicinity was from sixty to one hundred feet different in level from what it is now."

The economic materials met with in the region over which we have passed thus rapidly, are stated by Mr. Murray to be "the magnetic and specular ores of iron, galena, plumbago, and molybdenite, grindstones and flagging, scythe-stones and whet-stones, lithographic stone, building stones, limestone, marble, water-lime, brick clay, shell marl, and peat."

Ochres of iron are very generally disseminated through the Laurentian group. The localities where the magnetic oxyde was chiefly met with were in Bedford, Madoc, Marmora, Belmont, and Seymour, though it is believed to abound in many other places. Mr. Murray remarks that "the deposits of iron ore in Madoc, Marmora, and Belmont, some of which have long been known and been worked, will probably hereafter become of great commercial importance."

Magnetic iron ore occurs thickly but irregularly disseminated in a pale green epidotic rock, near the north shore of Crow Lake, as also at Allan's Mills in Seymour, over an area of two

or three acres, where the dome of Laurentian rock protrudes the fossiliferous limestone.

Specular oxyde of iron is known to exist at some places near the Deer River, north of Belmont Lake."

Galena was met with in veins, one of which was four feet thick, cutting the crystalline limestone of the Laurentian series, in the township of Bedford, in two places.

Plumbago is almost universally disseminated through the crystalline limestone, and frequently occurs in veins, giving the expectation that the quantity may be workable.

Molybdenite was found on a small island in Big Mud Turtle Lake, disseminatsd in huge veins of white quartz, accompanied by greenish scapolite, green cleavable pyroxene, sometimes assuming a radiating form, and iron pyrites," which abound in some parts.

Flagging of excellent quality is obtained in Loughborough and Starrington, from a rock belonging to the Potsdam sandstone formation, which also yields a stone whence grindstones may be made.

The mica slates associated with the crystalline limestones of the Laurentian series, yield a stone which may be used for scythe-stones and whet-stones.

In Marmora, Rama, Hungerford, and Madoc, lithographic stone is met with.

Along the whole range of country examined from Starrington to Bexley, the Black-River, Bird's-eye, and Chazy formations afford building stone, existing in courses of from one to four feet, the value and importance of which is likely soon to be appreciated, when communication is once established to the rear of the more level lands, by means of railroads."

"The stone buildings of Kingston are derived from the beds of what is supposed to be the Chazy limestone, and the beautiful market buildings of that city afford a good example of the rock. After being dressed, it has a good appearance;" but is somewhat brittle.

Below the village of Madoc a white and yellowish marble is found, which Mr. Murray thinks would take a good polish.

Water-lime is met with in the strata characterizad by the *Cythere*, and supposed to represent the Chazy formation. An escarpment occurs at the Knowlton Lake, Loughborough, bearing a strong resemblance to the rock near Bytown, from which what is called the Hull cement is derived. "In the ditch surrounding the fort at Kingston, there is a three feet bed of the same appearance, which has been successfully used as a water-lime."

Bricks are manufactured all along the shore of Lake Ontario. "The clay used for the purpose is of two kinds—one of a bluish or buff color, the other brownish; the former, where both are found in contact being the Lower Stratum."

These deposits Mr. Murray believes to have a great extent throughout the region. In his opinion, they might readily be met with wherever the courses of brooks have cut ravines through them.

Mr. Murray notices, as a circumstance worthy of observation, the fact that "the potter's clay, with occasionally a layer of sand, and the red brick clay above, appear to undulate with the general surface (not, however, descending to the bottom of deep ravines), while the white brick clay lies in very even horizontal strata, from which it would appear that the one must have been worn down into gentle hollows before the other, which may be much more recent, was deposited."

A great portion of the bottom of Loughborough Lake is stated to be a thick deposit of shell marl, the bottoms of all the Lakes from this to White Lake in Olden, being more or less of the same substance; two beds of it found in Sheffield, covering, the one an area of 200 acres, and perhaps more, with a thickness over the greater portion of at least ten feet; the other one of from 300 to 400 acres. The place where this bed occurs is mostly a marsh or swamp, and the deposit is covered over by an accumulation of peat averaging about four feet in in thickness. Mr. Logan's impression, while on the spot, was

that this peat was superior for fuel to any he had seen elsewhere. (Report, &c., for 1852-53, pp. 75-152.)

The substrata of the whole country on the shore of Lake Ontario, between the Rivers Rouge and Credit, are stated by Mr. Murray to be composed of Loraine shales, the thickness of which he estimates to be 1,110 feet.

REGION

Lying between the Confluence of the Ottawa and St. Lawrence on the East, and Gananoque and Ottawa City on the West.

In the area embraced within these limits, comprising about 10,000 square miles, there is, according to Mr. Murray, only one exception to its horizontality, which is found on the Rigaud Mountain, composed of trap, which has an elevation of 538 feet above the Riviere a la Graise, where this stream joins the Lake of Two Mountains, while the land, for two miles southward from the summit maintains a considerable elevation, overlooking the level tract beyond, up and across the St. Lawrence.

This portion is represented as being of a good agricultural character where cleared, and producing much heavy pine timber in its forests, while the country, which flanks to the west, is hilly, though not mountainous, with numerous exposures of rock. On the north it is still more rugged.

The rocks of the area under review, Mr. Murray describes as constituting a trough, of which those that underlie the level part are determined by their organic remains, to be of the Lower Silurian ore, while those composing the hilly or mountainous rim are "a highly crystalline, unfossiliferous, metamorphic series of greater antiquity."

The character of the Metamorphic series in the Thousand Islands, which are scattered over the face of the River between Brockville and Prescott, making the soil between these points, especially on a fine summer's day, so enchanting, and on the

immediate north bank of the St. Lawrence, "is that of micaceous and hornblendic gneiss, the elementary minerals of which prevail more or less in all the layers; and according as some one of such minerals preponderates in a bed, it gives it a micaceous, hornblendic, feldspathic, or quartzose character. Such beds are variously interstratified with one another, and some occur which are a nearly pure quartzite. In some parts there occurs an alternation of white and grey quartzite, the former sometimes very pure white, and occasionally vitreous, perhaps fit for glass-making, as at Blockhouse Island, and the main shore near Brockville."

"The Lower Silurian group of Rocks, under the more level parts of the district, are, agreeably to the nomenclature of New York, and in ascending order, as follows:"

Potsdam Sandstone.
Calciferous Sandrock.
Chazy Limestone.
Birdseye, Black-River, and Trenton Limestones.
Utica Slate.

The Potsdam Sandstone, resting unconformably on the metamorphic rocks, is traceable from Brockville to the vicinity of Perth. On the eastern side it can be followed from the cascades, by Vaudreuil, to Regaud.

Of this sandstone the cliffs below Brockville expose a sequence of seventy-five to eighty feet thick, having "interstratified calcareous bands at the top, and a coarse silicious conglomerate at the base." Beginning two-and-a-half miles above the town, an outlying patch occurs, which extends along the banks of the river for seven miles. Fucoids are found on the surfaces of many of the upper and finer beds of these exposures, with a number of small cylindrical holes, recognised as the *Scolithus linearis* of Hall.

This formation is largely developed at Charleston Lake, and outliers occur on many of the islands by which it is studded. A section of seventy-one feet was measured about a mile southwest from Charleston village.

It is found also in Lansdown, Bastard, Elmsley and Montague. Between the Cascades and Rigaud, (near Pointe du Grand Détroit,) it assumes a reddish tinge owing to the presence of small decomposing grains of reddish feldspar.

The superficial deposits which spread over the area between the Ottawa and St. Lawrence, and generally conceal the older formations, consist of clay, gravel, and sand; the first greatly prevailing on the eastern side,—the last, in the western and higher portions of the country, especially towards the shores of the St. Lawrence.

Clays present themselves on the Ottawa, near Bytown, which contain marine shells of the species *Saxicava rugosa;* besides which there occur at the mouth of Green's Creek two species of fish, the Mallotus villosus or common capeling, and Cyclopterus Lumpus or lump-sucker, which are still inhabitants of northern seas; the capeling still frequenting the Gulf of St. Lawrence in great numbers, and the lump-sucker the northern coasts of Scotland and America. The fossil representatives of these species are always inclosed in nodules of indurated clay of reniform shapes, and they appear to occupy a bed nearly on a level with the water of the Ottawa, about 118 feet above the tide level of Lake St. Peter; the same sort of nodules frequently enclose fragments of wood, leaves of trees, and portions of marine plants; among the last is one of the species of littoral algae still found near the coasts of Arctic seas."

A vast accumulation of the *Tellina Groenlandica*, overlying a two-feet bed of limestone gravel and more angular fragments, was observed in the fifth concession of South Gower, near Kemptville, at an elevation of thirty to forty feet above the Rideau Canal, or about 250 over Lake St. Peter. *Saxicavæ rugosæ* were met with between the fifth and sixth concession of Winchester, near Armstrong's mills, 300 feet above Lake St. Peter; and *Saxicavæ rugosæ* and *Tellinæ Grœnlandicæ* in the bed of the Garry River in Kenyon, at a height

of 130 to 140 feet over Lake St. Francis, or 264 over Lake St. Peter; besides other places of a similar elevation.

"On Rigaud Mountain there is a set of plains, paved with an accumulation of well-rounded boulders, which begin on the north side, about 200 feet over the level of the Rivière à la Graisse, at its junction with the Lake of Two Mountains, or 262 feet over Lake St. Peter, and extend over a large area, filling up hollows between elevated summits of trap; these plains rise gradually to the south, until they reach their maximum elevation of about 280 feet over the Graisse, beyond which they slope gently off to the south, and the boulders are found scattered over a large portion of the Seigniory of Rigaud. By far the greater portion of the boulders are the remains of the trap of the mountain, but there is likewise a small proportion of Sandstone." They are from three to eighteen inches in diameter; the hollows containing them being from four to six feet. A depth of seven or eight feet has been gone down without reaching the bottom of these accumulations.

The Economic Materials occurring in the district under description are stated by Mr. Murray to be—"Ores of iron, lead and copper, iron ochre, sulphate of barytes, sandstone and sand for glass-making, shell marl, materials for ornamental and common building purposes, and mineral pitch." For their distribution and quantities see Geological Report for 1851–52, pp. 57–90.

The bog ore used at the St. Maurice Forges near Three Rivers, is "known to produce an iron of excellent quality." Near Beverly, in Bastard, this ore was also observed.

Lead ore is found in Lansdown, in connection with calc-spar, through a vein of which, intersecting coarse disintegrated limestone belonging to the Metamorphic series, it is disseminated irregularly in small crystals.

A specimen of copper ore, weighing several pounds, was procured at Beverly for the late World's Fair.

An iron ochre which, in the opinion of Mr. Murray, would

by proper cleaning yield an ochre-red equal to any of the imported paints of that description, was met with on the property of Mr. Lancaster, in Vaudreuil. On the same lot, and in other places named, phosphate of iron presents itself, of a blue color, which is frequently used as a pigment.

Sulphate of Barytes, used for the manufacture of *permanent white* and *Dutch white*, is obtained on lot 24, tenth concession of Bastard. The vein containing it is traceable for a quarter of a mile. "The value of the crude material is said to be eight to ten dollars per ton to the manufacturer, and the manufactured article thirty dollars per ton."

On Blockhouse Island, opposite Brockville, "a white close-grained, translucent semi-vitreous quartz" is met with, which Mr. Murray thinks likely to be serviceable for glass-making.

Deposits of Fresh-water Shell Marl occur on lot thirteenth, eighth concession of Yonge, in a lake in Elmsley, and on Mr. Delesderiers' farm, near Point Cavagnol, in Vaudreuil.

The Stone used for building purposes at Brockville and Prescot, is taken from the beds of the calciferous sand-rock formation, which are quarried extensively. The beds selected as yielding the most durable stone and the handsomest when faced, are those which contain the largest amount of calcareous material, which are worked in courses from 12 to 15 inches thick. Stone of this formation has been extensively used in the construction of some of the locks of the Rideau Canal, which afford in general good examples of it. It is strong, tough, and sufficiently durable,—grey when first wrought, but soon turning yellowish under the influence of the weather.

The black limestones which run through the township of Cornwall afford an excellent building material, of the character of which the locks on the Cornwall Canal, which are formed of it, afford a good specimen.

Here we beg to present a few extracts from a Report having relation to the region before us, presented by A. C. Brown to the "Committees appointed to Promote the Construction of the St. Lawrence and Lake Huron Railway," printed at Og-

densburgh, N. Y., 1852,—which may illustrate Mr. Murray's statements, (though not required to corroborate them,) and aid the reader in forming his opinion of it.

This section of Canada, which is generally level and gently rolling, contains, according to Mr. B., a territory equal to five New England States,—which have a population of two millions,—and is important not only for its great agricultural, mining, and manufacturing capabilities, but also for its variety of highly interesting scenery. In Mr. B.'s opinion it is likely to become one of the richest and most attractive in all Canada.

The soil throughout this large section is rich and durable. It is a first-rate wheat-growing country, and also well adapted to most other agricultural productions. It is alike favorable for grass and all kinds of grain. No country excels it in quality or quantity of its crops, nor for the variety of its productions. The same farm exhibits, side by side, rich fields of wheat and most luxuriant meadows; also a thrifty growth of other grain and various kinds of vegetables. The wheat-growing States of the West are not generally, like this section well adapted to first-rate dairies. Notwithstanding this country is comparatively new, and most of the settlements but recently made, many well-cultivated farms are to be met with. Forty bushels of wheat, and three tons of hay per acre, are a very frequent yield. Fields which have produced wheat for twenty years, seem to be not in the least impoverished. A soil so durable and fertile, producing so abundantly, and such great variety, must afford a large amount of agricultural exports.

A great variety of valuable timber is found in this part of Canada. In some places extensive forests of large and tall white oak, mixed with maple, elm, and other kinds of timber, are to be met with. Frequently large-sized white pine and white oak are also intermixed. Around some of the Lakes are extensive oak plains, which prove to be excellent wheat land. In lower, moist land, grow fine ash, cedar and tamarac. When cleared, these somewhat swampy lands are best for grass.

When opened to the sun, in a few years they also make excellent lands for ploughing.

No equal extent of country is more favourably situated for manufacturing. The great variety of Lakes . . seem Nature's intended arrangement for hydraulic purposes. Rice Lake, thirty miles long . . is 365 feet above Lake Ontario. The River Trent, the outlet of this lake, runs easterly about thirty miles to its junction with Marmora or Crow River, and falls 135 feet in its course to this point. Marmora Lake . . is 130 feet above this junction. Crow River . . is the outlet of Mathune, Belmont, and Marmora Lakes.

From this division line westerly and along the River Trent and its Tributaries, in the Townships of Seymour, Belmont, Mathune, Percy, Asphodel, and Dummer, are numerous grist and saw-mills, and also a large amount of unoccupied water-power. At Norwood, on the Ouse River, at Warsaw, on the Indian River, at Keane, and various other localities along these rivers are a number of grist and saw mills, and numerous water powers."

Many other places are named as possessing important water privileges. Along the Severn, which falls 110 feet into Georgian Bay in its course from Lake Simcoe, there are stated to be seven falls, the last of them on the navigable waters of the Bay, at all of which is "ample hydraulic power for extensive manufacturing establishments."

Lake Simcoe Mr. Brown declares to be one of the most beautiful sheets of water in Canada. Its pleasant, gently sloping shores exhibit luxuriant vegetation. The farming country around it is not excelled by Western New York. (Pp. 4–18).

REGION

Between Beauharnois and Riviere Du Nord.

The physical structure of this region is so similar to that of the section last considered, that the description of the one is

to a large extent a description of the other. "The same succession of formations spreads out," according to Mr. Logan's statement, under both. In ascending order they are as follows :

Metamorphic or Gneissoid Group.
Potsdam Sandstone.
Calciferous Sandrock.
Chazy, Birdseye, and Trenton Limestones.
Utica Slate.

"The Potsdam Sandstone formation," says Mr. Logan, "resting unconformably on the Metamorphic series (the latter consisting of gneiss and interstratified limestone), occupies a narrow strip on the north side of the St. Lawrence, below Montreal, at a variable distance of ten to twenty miles from the north bank, and sweeps round from the valley of this river to that of the Ottawa, the turn forming an obtuse angle on the Rivière du Nord. The same formation, in the same relation, proceeding from Keeseville in the State of New York, turns from the valley of Lake Champlain to that of the St. Lawrence, and, forming a sharper angle, is projected out across the county of Beauharnois towards the previously mentioned bend, in a long tongue of sandstone, pierced near the extremity by Mont Calvaire, a protruding mass of the subjacent gneiss. From Beauharnois a broad belt of the sandstone has been traced in New York, by the Geologists of that State, in a pretty straight line, at a variable distance from the bank of the St. Lawrence to Hammond, near which it reaches the river. It here crosses the river, and it will be perceived by Mr. Murray's Report, that he has traced it through the Townships of Elizabethtown, Yonge, Lansdowne, Bastard, and South and North Crosby." It is distributed also through Burgess, Elmsley, Drummond, Beckwith, Ramsay, Packenham, March and Nepean, and "has been met with in one spot tending to a junction by Grenville, with the exposure on the Rivière du Nord.

The perimeter formed by the sandstone, or the gneiss beneath it, when the sandstone is wanting, gives the area within it the shape of a peninsula, the isthmus to which, between the Rivière du Nord and the border around Mount Calvaire, is about five miles across.

The sandstone of Beauharnois county and the neighbouring State of New York, is stated to be from 300 to 700 feet thick.

Tracks, having very much the appearance of footsteps, and impressed with a surprising regularity, which Mr. Logan has described with great skill, were met with in several places,—among others near the mill on the St. Louis River, near Beauharnois. In the opinion of Professor Owen, to whose examination a number of specimens were submitted, these marks have been imprinted by some species of crustacean "of a family wholly distinct from anything that can be suggested by the crustacean forms of later rocks, or of the present day." In the case of the more perfect specimens a "median groove more or less flat," and differing in width with the specimens, presents itself between the foot prints on each side, which are in answering pairs, that to Mr. Logan looked as if produced by an "immovable breast-plate or plastron," though "in one remarkable instance, at a bend in the track, the groove gradually leaves the middle, and while it seems impressed with more than usual force, approaches and partially obliterates the foot-prints on the convex side, as if the impressing part had been the extremity of a tail, which, when the body turned to one side, interfered with the foot-prints in the rear, on the other." "A feature common to all the grooves is, that each repetition or homologue of the foot-prints is accompanied with a deepening and shallowing of the groove, giving it the appearance of a chain of shallow troughs, which, when the impression is light, are separated from one another by intervals of the ungrooved surface." . . "In one of the tracks there are three narrow grooves instead of foot-prints on each side of the main one, for a certain distance, as if the limbs of the animal

had been dragged along the bottom, while the body was afloat."

"The surfaces on which the tracks of these animals are impressed are sometimes smooth and sometimes beautifully ripple-marked. On the ripple-marked surfaces the tracks have often beat down the ripple, and the sand of the ridge has been dragged into the furrow, in such a way as to show the direction in which the animal was progressing."

The ripple-marks sometimes run in different directions on the surfaces affected by them, as if "caused not by a current in deep water, running in one general direction, but by a tide ebbing and flowing, and obeying the influence of varying local accidental causes. On one surface was observed the natural edge or termination of the ripple ridges, with a track coming up to it and there ceasing, as if the wave had reached no farther, and one part of the surface had been dry while the water, operating on another close by, had obliterated the track in producing the ripple-mark." (Report for 1851–52, pp. 6–12.)

For the more minute particulars in respect to the geographical distribution of the rocks of this region, the reader is referred to Mr. Logan's Report, pp. 12–20.

The Economic materials of the area under consideration are, —Magnetic iron ore, iron ochre, stone and sand fit for glass-making, phosphate of lime, fire-stones, clay for common bricks and common pottery, with building and paving materials, and hydraulic limestone.

Small patches of reddish-yellow iron ochre were met with in Hemmingford in the Potsdam formation, to which the inhabitants of the vicinity resort for materials wherewith to colour their walls.

Excellent sandstone fitted for glass-making, and used at the glass manufactory in Vaudreuil, is obtained from the bank of the river above the Point du Grand Detroit. In the opinion of Mr. Logan, it may be procured in almost any position in which the sandstone which crosses Beauharnois is exposed.

Phosphate of lime, which is of much value as a mineral manure, was discovered in several places within the area under

notice. Black phosphate nodules occur at the base of the Chazy limestone in the first concession of Hawkesbury, such as those reported by Mr. Murray as existing in Lochiel.

In the counties of Beauharnois and the Lake of Two Mountains, Mr. Logan states clays for common bricks and pottery to be so prevalent that it would, perhaps, be more difficult to say where they are not to be found than where they are.

Good stone for building occurs in abundance in the County of Beauharnois, wherever in fact the Potsdam formation, especially the upper part of it, prevails. In colour it is generally white, though some portions of it are slightly tinged with iron. Such is its power of resisting heat that it is used in some places as furnace hearths, and that the walls of a building erected from it, which may be burnt, will still remain serviceable. The Caughnawaga and St. Geneviève stones, which belong to the chazy limestone, are grey, and take a good face from the chisel. The Grand Isle quarry yields a good blue limestone, and one of a similar description has been traced from Carillon to Grenville.

The whole of the purer limestone beds mentioned as yielding good building stone, yield also good lime ; but for the facility with which it is burnt, and the superior whiteness of the lime, none of them equal the black limestone of St. Claire, which is so highly valued for white-washing that it is carried a distance of twenty miles on the south side of the St. Lawrence.

Stones suitable for flagging are described as being met with in two localities in Hemmingford. (Report for 1851–52, pp. 27–37.)

Before passing down the St. Lawrence, we would invite the reader's attention for a short time to the region of the Ottawa.

The Ottawa River is second only to the St. Lawrence in size and commercial importance. With its tributaries it drains, according to Mr. Logan, an area which cannot

fall much short of 80,000 square miles. The hydrographical basin containing the waters discharged by it is described by him as "bounded on the east by a line commencing at the lower extremity of the Island of Mon-Montreal, and running about 250 miles in a nearly direct course, to a point about half a degree north of the intersection of the 48th parallel of North Latitude, and the 76th meridian of West Longitude, constituting in this distance the watershed between the Ottawa streams and those of the St. Maurice and Saguenay. From this point, where the source of the river is to be found, the boundary turning to the westward, runs for 300 miles along the height of land dividing the waters of the Hudson Bay Territory from those of Canada, to the vicinity of the intersection of the 48th parallel of Latitude with the 82nd meridian of Longitude. The western limit stretching from this corner to within a few miles of the most eastern part of Lake Nipissing, thence to the Townships of Tudor and Grimsthorpe in the Midland District, and further on to the Township of Hinchenbrook, separates it from the streams tributary to Lakes Huron and Ontario; while the southern line, passing between North and South Crosby to Elizabeth Town, thence to the Township of Lochiel, in the Eastern District of Upper Canada, and forward to Vaudreuil in Lower Canada, leaves but a small space between it and the St. Lawrence.

The general shape of this area is that of an irregular rhomboid, with its long diagonal pointing north-westwardly, and roughly parallel with three sides of the rhomboid, the north, the west, and the south, at a distance seldom exceeding twenty, and sometimes not over eight leagues, the great artery of the region runs, presenting a length of between 600 and 700 miles. Taking its source in the northeastern corner, it heads with the Saguenay and St. Maurice, and, flowing in a general course a little to the south of west, it widens into several considerable lakes, and is fed by several tributaries from the north before it reaches Temiscaming, at a distance of about 256 miles."

Midway between Temiscaming and the source of the Ottawa lies the Grand Lac, consisting of three narrow transverse belts of water united by straits,—the easternmost of which, with a length of forty miles, varies in breadth from one to ten. The length of the middle belt is fifty miles, its average breadth being five or six ; the western, which is parallel to the middle, has a length of thirty miles, with a breadth of from two to twelve.

About fifteen miles above Temiscaming is another expansion of the Ottawa,—with an east and west length of forty-five miles, and a breadth of from two to twelve,—which bears the name of the Rivière and Lac des Quinze, from the number of Portages which occur (fifteen) within the last twelve miles.

The waters of the Blanche—flowing from the north, and being navigable for canoes for sixty miles without a Portage—join Temiscaming about two miles to the west of the Quinze.

Lake Temiscaming—sixty-seven miles in length, with a breadth gradually diminishing from six miles to five hundred yards—is navigable through its entire length, and has a sufficient depth of water for " respectable sized craft."

Thirty-five miles below Temiscaming, the Ottawa receives the Matawa,—36 miles in length in a direct course, 40 following the bends,—which " consists of a chain of lakes united by short and slender streams, flowing from one to another." In Mr. Logan's opinion this river is destined to become of importance, " having been oftener than once thought of as affording the best line for a canal, to connect the waters of the Ottawa with those of Lake Huron by Lake Nipissing."

Between this point and Bennett's Brook, (where Mr. Logan's measurements commenced,) the Ottawa is enlarged by the tributary waters of the Metabeechuan, the Montreal River, the Keepawa, and the Rivière du Moine. Of these the second, which rises in the northern height of land already noticed, has a course of 120 miles in length ; the third, which has its source in a Lake about sixty miles east from Temiscaming (in which also the Rivière du Moine originates), winds through a

length of ninety miles, constituting a chain of connected lakes,—one of which is itself fifty miles long; while the fourth (the Du Moine), with a length of nearly ninety miles, is stated by Mr. Logan to be the largest tributary entering the river within the limit of his measurements.

Immediately below Temiscaming a collection of rapids occurs, called the Long Sault, which together make a fall of forty-nine feet in five distinct leaps (each of which has a separate name), producing five Portages to voyageurs going up stream," though "canoes shoot the whole in descending, unless under particular conditions in the height of the water, which greatly varies at different periods of the year."

Above the entrance of the Matawa three other rapids are met with, at intervals of about three and a-half miles,—" at each of which the river is contracted to a narrow space, and is impeded by ledges of solid rock projecting from the sides, or starting up in small islands." The first, the Mountain Rapid, has a fall of five feet five inches; the second, the Erables, a fall of thirteen feet; the third being "divided into two steps, with the names of the Chaudron and the Cave, which are leaps of six feet, and five feet nine inches respectively. In the parts intermediate between the rapids and below them, the banks are bold, precipitous and rocky, with an average separation of a quarter of a mile from one another, and the river, particularly towards the latter portion of the distance, runs in a section across a range of hills rising to heights of about 400 and 500 feet."

Several other rapids are met with within the space examined by Mr. Logan, viz., the Levier, with a fall of eight feet; the Maganasipe, with a descent of nearly nine feet; the Deux Rivières with a step of thirteen feet; and the Roche Capitaine and Maribou, which make between them a descent of forty-two feet ten inches. (Geological Report for 1845–46, pp. 13–20.)

From Bennett's Brook thirty-seven miles bring us down to the Falls and Portage Des Allumettes, where, Bouchette in-

forms us, "the Ottawa is divided into two channels, the one to the north-east, the other to the south-west of a large island, in length about 15 miles, by an average breadth of four. The southerly channel expands below the Falls and Rapids of the Grand Allumetts to the width of three or four miles, and forms the Lake Des Allumettes, at the head of which an arm of the river opens an entrance to the Mud and Musk Rat Lakes."

From the bottom of the Lake Des Allumettes to Ottawa City (Bytown), the distance is about 113 miles. Within this space several islands occur,—one of them about thirteen miles down, having a length of about twenty miles, with an average breadth of seven;—and a number of cascades, the D'Argis, the Chenaux, and the Rapides Des Chats at the foot of the lake of that name, three miles in length, where, through a "labyrinth of varied islands," the waters take a sudden leap of from sixteen to twenty feet over the Falls of the Chats.

Lake Chaudière, six miles below, is 18 miles in length and 5 broad, with shores bold on both sides. The Rapides des Chenes follow at a short interval, after which come the Chaudiere Falls, Great and Little, (in the neighbourhood of Ottawa City,) above which the river has a breadth of 500 feet.

These Falls are occasioned by the deep and sudden subsidence of the horizontal strata of limestone which compose there the bed of the Ottawa.

The principal Falls (the Great Chaudiere), which are sixty feet high, and 112 wide, are "situated near the centre of the river, and attract by their forcible in-draught a considerable proportion of the waters, which, strongly compressed by the circular shape of the rock that forms the boiling recipient, descend in heavy torrents, struggling violently to escape, and rising in spray-clouds which constantly conceal the lower half of the falls, and ascend at irregular intervals in revolving columns much above the summit of the cataract."

"The Little Chaudiere may without much difficulty be approached from the Lower Canada shore, and the spectator, standing on a level with the top of the fall, and on the brink

of the yawning gap into which the floods are headlong plunged, surveys the whole length of the *chute* and the depths of the cavern." Much of the water is described by Bouchette as passing away subterraneously through fissures in the rock.

Below the Falls of Chaudiere the Ottawa is navigable for steamboats to Grenville, a distance of sixty miles. The current is gentle, while the banks of the river are generally so low as to be flooded in spring to a considerable distance in the interior, especially on its northern side.

The impetuous Long Sault, which commences at Grenville, is descended only by *voyageurs* and raftsmen of experienced energy and skill. The river below continues rapid and unnavigable as far as Point Fortune, where it expands into the Lake of Two Mountains, and finally forms a junction with the St. Lawrence below the St. Anne Cascades.

The waters of the two streams are distinguishable for some distance beyond their point of junction; the black hue of the Ottawa contrasting strongly with the bluish-green of the St. Lawrence.

From a writer quoted by Smith in his "Canada: Past, Present, and Future, (Vol. II., pp. 341–357,) we collect the following additional particulars:

Besides the tributaries already named, the Ottawa receives the following, viz.: The Petewawa, having a length of 140 miles and draining an area of 2,200 square miles, which enters it at the Upper Allumette Lake; the Black River—130 miles long, and draining an area of 1,120 square miles—which it receives from the north, at the head of Lake Coulange, 79 miles from Bytown; the Coulange, about 9 miles farther down, supposed to be 100 miles in length, with a valley of 100 square miles; the Bonchere—50 miles above Bytown—110 miles long, and draining an area of 980 square miles; eleven miles lower the Madawaska, 210 miles long, and draining 4,100 square miles; the Mississippi—26 miles from Bytown—which has a length of 101 miles, and drains a valley of 1,120 square miles; and at Bytown, the Rideau from the west, with a

course of 116 miles, in which it drains an area of 1,350 square miles. The Rivers stated to join the Ottawa below Bytown are : The Gatineau—from the north, a mile below Bytown—which has a course probably of 420 miles, and drains an area of 12,000 square miles ; and, at various points lower down, the Rivière du Leivre, 260 miles long, and draining 4,100 square miles ; the North, and South Nation Rivers,—the former 90, the latter 100 miles in length ; the River Rouge—90 miles long—which enters from the North ; the River du Nord—160 miles long—from the same side ; and finally, just above its mouth, the Assumption, which has a course of 130 miles. From the mouth of the Ottawa to Bytown the distance is 130 miles. The volume of water discharged by the Ottawa when at its height is alleged to be twice the common volume of the Ganges.

The valley of the Ottawa is computed to be eight times the extent of Vermont, or ten times that of Massachussets, capable, taking Scotland as our data, of ultimately maintaining a population of eight millions.

Mr. Logan's measurements make Lake Temiscaming 612 feet ; the Mattawa, at its junction with the Ottawa, 519 feet 5 inches ; Upper Trent Lake 690 ; and Lake Nipissing 665 feet above the level of the St. Lawrence at Three Rivers. (Report for 1845–6, pp. 30–38.)

The region of the Ottawa embraces a very large quantity of excellent land, with supplies of the common woods of the country—the red and white pine especially—which would seem all but exhaustless.

Along the whole valley of the Ottawa, clays, sands, gravels, and boulders are met with in many parts. Deposits containing marine testacea of the post-pliocene period, " cover the whole valley of the South Petite Nation, and its tributaries ; and were found in Templeton, Hull, Nepean, Packenham, and Fitzroy, to the mouths of the Mississippi and Madawaska, some of them 330 feet over the level of the sea, *Saxicava rugosa* being found as high as 410. A specimen of *Mallotus*

villosus, or common capeling—a small fish still frequenting the shores of the Gulf of St. Lawrence—which had been obtained at the mouth of the Gatineau, was in Mr. Logan's possession when he wrote.

"Fresh water shell marls occur in many places in the alluvial deposits of the Ottawa, and among the phenomena which come within the recent period, rounded and polished rock surfaces, bearing parallel grooves and scratches, are of not unfrequent occurrence." On the shores of Lake Temiscaming they are specially numerous, and so circumstanced as to make them matter of great interest.

Deep water-worn holes occur in the rock on the banks of the Ottawa, considerably above the highest level which the river has been known to attain. One, of an uncertain depth, 18 inches in diameter, was found 60 feet over the existing surface of the water; another, measuring two feet by two and a-half, at a height of twenty-five feet.

The Economic Materials of the Ottawa are,—magnetic and specular oxides of iron, which are very abundant, bog iron ore, brown ochre, iron pyrates, galena, copper pyrates, plumbago, marble, building stone, flagging, tilestones and slates, grind-stones and whet-stones, mill-stones, stone fit for glass-making, water-lime, common lime, shell marl, and peat. A considerable number of mineral springs are likewise met with. For a very full account of the character and distribution of the Rocks of the Ottawa and its region, the reader is referred to the Geological Report for 1845–46, pp. 40–98.

ISLAND OF MONTREAL.

At the confluence of the Ottawa and the St. Lawrence lies the beautiful Island of Montreal, triangular in shape, and having a length of 32 miles by a breadth of 10½—separated on the north-east by the Rivière des Prairies from Isle Jésus. With the exception of the mountain, the ridge of the Coteau St. Pierre, and one or two smaller ones of no great elevation,

it exhibits a level surface, watered by several little rivers and rivulets. From the City of Montreal, which stands on its south side, the shores towards the east are from 15 to 20 feet above the St. Lawrence; but on the opposite side, towards La Chine, they are low.

"The soil of the whole island, if a few insignificant tracts be overlooked, can scarcely be excelled in any country, and is highly productive of grain of every species, vegetables, and fruits of various kinds." (Bouchette.)

NORTH SIDE OF THE ST. LAWRENCE.

The country lying between the upper end of the Island of Montreal and Cape Tourmente, on the left side of the St. Lawrence, and occupying the space intervening between the river and the Metamorphic hills, to which Mr. Garneau has given the name of Laurentides, "has a length of about 200 miles; and it gradually widens from a point at Cape Tourmente, to about 30 miles at Montreal, having thus an area of about 3,000 square miles. It presents a general flat surface rising in many places by abrupt steps, (the marks of ancient sea-margins,) into successive terraces, some of which are from 200 to 300 feet above the level of the river, and the whole have a general parallelism with it. These terraces are occupied by clay and sand, and the latter predominating, gives them, as a whole, a light soil. The rivers which cross it, (some of them large streams, of which the St. Maurice is the greatest,) descending the flank of the Metamorphic hills, all give a succession of falls and rapids before reaching the plain, affording a great variety of beautiful and picturesque cascades, and yielding a vast extent of water power, capable of application to sawing timber and other manufacturing purposes. Quitting the Metamorphic rocks, these streams at once cut deep into the softer deposits of the plains, sometimes at a leap attaining nearly the level of the St. Lawrence, and intersect the country by numerous nearly parallel ravines; they generally display

steep banks of clay and sand, but in a few instances run in troughs, exposing perpendicular sections of slightly inclined strata of limestone or black shale, piled upon one another from the height of from twenty to eighty feet." (Geological Report for 1852–3, pp. 4–8.)

To prevent confusion, Mr. Logan applies the name Laurentian series to the rocks underlying the fossiliferous formations of this part of Canada, because of its greater definiteness, instead of the Metamorphic given in his previous Reports.

The geological formations underlying the district above named, are, in ascending order:

1. Laurentian Series.
2. Potsdam Sandstone.
3. Calciferous Sandrock.
4. Chazy Limestone.
5. Birdseye, Black River and Trenton Limestones.
6. Utica Slate.
7. Hudson River Group.
8. Oneida Conglomerate.

—(For particulars see Mr. Logan's Report, pp. 8–40.)

The Economic Materials of the above section are, bog iron ore in many places and considerable quantities, iron sand, wad or bog manganese, clay for common bricks and pottery, building stones and flagging stones, refractory sandstone, sand for glass-making, marble, peat, bituminous shale and tripoli earth, with mineral springs.

The country between the St. Maurice and the Batiscan is noticed as specially abounding in iron ore. A considerable field of it exists also on the south side of the river, in the Seigniory of Champlain. Five patches of yellow ochre,—one of them having an area of six square yards,—were observed about 300 yards from the bank of the Great Yamachiche River. A very large ochre bed is situated on the St. Nicholas range of Pointe-du-Lac. "In the vicinity of Montreal the lower part of the Trenton formation holds massive beds of grey

granular limestone, from which a very arge amount of the best building material used in the city has been obtained." Limestones of various sorts are found in quite a number of places within the area under review. The building and flagstones noticed by Mr. Logan in his sketch of their distribution, all belong to the fossiliferous formation, though the gneissoid masses would, in his opinion, supply a great abundance of lasting material,—which, however, would be more expensive to work. Many peat bogs of large and small extent exist in this area. At Laval, about twenty miles from Quebec, there is a considerable deposit of Tripoli earth, which is used for cleaning and polishing metals. (Report for 1842–43, pp. 41–70.)

The mountainous character of the northern shore of the St. Lawrence has properly its commencement, according to Bouchette, at Cape Tourmente, although its banks above Quebec are "for many miles high, bold, and majestic. From Cape Tourmente the ridge continues unbroken, except by the beds of rivers and rivulets, until it effectually subsides thirteen or twenty miles below the Saguenay, in which quarter the boldness of the north shore sinks to a moderate level, presenting a degree of flatness and equality of surface singularly contrasted with the opposite shore, which now becomes mountainous, rugged and abrupt.

"This tract of country is traversed between the west boundary of the county of Quebec and the Saguenay by numerous rivers and streams; the best known and most considerable of which are the St. Charles, the Montmorenci, the Great River or Ste. Anne's, the Rivière du Gouffre, the Mal Bay, the Black River, and the Saguenay. . . Besides these there are many smaller streams and tributary waters, not a few of which are imperishable springs that supply the inhabitants with the purest water, at the same time that they moisten and fertilise the soil. On several of the streamlets, as well as the rivers, are frequently to be found excellent mill sites, formed by the rapidity of the water courses, consequent upon the hilly cha-

racter of the country. Of the rivers above mentioned the Saguenay is the only one yet known to be navigable to any extent, vessels of any burden being able to ascend upwards of seventy-five miles above its estuary."

The River Montmorenci is specially distinguished on account of the Falls at its mouth, about 9 miles below Quebec, which are "celebrated for their height, magnificence, and beauty. Violently projected over a perpendicular rock into a precipice 240 feet deep, the waters of the Montmorenci descend in a bright fleecy sheet, of snowy whiteness, to the broad recipient beneath, which forms a deep bay, whose sides rise, almost vertically from the foot of the Falls, to an altitude several feet above their summit. The lower regions of the cliffs are destitute of vegetation, but it gradually makes its appearance at the elevation of 50 or 60 feet, and continues with more apparent vigour to the highest point of the towering banks, the verge of which is lined with shrubs and trees." . . "The basin under the Falls is nearly semicircular, the Falls themselves occupying the depth of the segment, whilst its chord forms the general line of the ford which is practised (crossed) at low water. The most advantageous view of the Falls is perhaps to be had from the left bank, but there are a variety of beautiful points of view in which they may be beheld." (Bouchette, Vol. I., pp. 277–279.) "When the St. Lawrence is frozen below the Falls," says W. Green, Esq., (Notes on the Country about the Montmorenci.—Transactions of Quebec Lit. and Hist. Soc., Vol. 1st., p. 187,) "the level ice becomes a support on which the freezing spray descends as sleet. It there remains and gradually enlarges its base and its height, assuming an irregularly conical form. Its dimensions thus continually enlarging, become, towards the close of winter, stupendous. Its utmost height in each season usually varies much, as the quantity of spray it is formed of depends upon the degree in which the water producing that spray is copious." In march, 1829, it obtained an altitude of 126 feet. The cone which is formed is perceptibly, though slight-

ly, tinged of an earthly hue, derived, it is supposed, "from infinitely comminuted particles" from the bed of the river, "abraided by the torrent, and carried into the atmosphere with the spray." "The formation of this cone may, it is thought, suggest, some explanation of the way in which the glaciers have been formed."

What is called the Saguenay country commences at the lower end of the Seigniory of Eboulemens, whence it extends to Cape Cormorant, a distance of about 95 leagues, running back, at the same time, a considerable distance into the interior. Much of it is rocky, though portions of it are described as fertile. (Geol. Report for 1849–50, p. 7; also Bouchette, Vol. I., pp. 285–291.)

The scenery on the Saguenay is described as very bold, its banks rising in many places to a great height.

Between the mouth of the Saguenay and Anee au Sablon, on the Labrador coast,—whence a line drawn due north to the 52nd parallel of north latitude forms the eastern boundary of the Province,—there is a frontage on the St. Lawrence and Gulf of 665 miles. Below the Saguenay, the mountainous boldness of the north shore gradually subsides in approaching the Bergeronnes, and sinks to a more moderate elevation at Portneuf, a trading Post, situated about 40 miles below the Saguenay. The mountains below this river recede to the distance of four or five leagues from the immediate borders of the St. Lawrence, leaving a tract of gradual ascent at their base, composed of swampy land, covered with moss to the depth of three feet. "East of Portneuf, the shores continue for some miles to preserve a moderate and regular elevation, and in various parts offer to the eye white cliffs of sand, chequered by tufts of ever-green. Descending towards Pointe des Monts, the altitude of the banks becomes greater, and the characteristic boldness of the north shore is again resumed; but here the mountains to the southward do not yield in height or continuity to those rising to the north, and both shores of

the gulf are conspicuously remarkable for their lofty, frowning, and forbidding aspect."

The chief Rivers discharging themselves into the River and Gulf of St. Lawrence, between the Saguenay and Ance Sablon, are the Grande and Petite Bergeronnes, the Portneuf, Mississiquinack, Betsiamites, Bustard, Manicougan, Ichimanipistick or Seven Islands, St. John, St. Austin's, and Esquinaux." The country has been little penetrated except by the Indians.

Extensive fisheries are carried on along the coasts of Labrador. Those on the Gulf are exceedingly productive.

Great part of the region just noticed, with a portion of the country lying west of the Saguenay, bears the name of the *Domaine*, from the fact that a lease of it was granted by the French King in 1733 to a company called the King's Posts' Company, to which was guaranteed the exclusive privilege of bartering, hunting, and fishing within its limits. (Bouchette, Vol. I., pp. 292–295.)

SOUTH SIDE OF THE ST. LAWRENCE.

Between Montreal and Quebec the valley of the St. Lawrence has a general north-east course, and presents a flat surface on each bank of the river; extending on the north-west side to a breadth of from 12 to 20 miles, and on the south-east of 30 or 40—to the foot of a range of mountains, already noticed, which is a continuation of the Green Mountains of Vermont. Though after entering Canada these mountains lose much of their elevation, two or three isolated peaks attain in the district of which we speak a height of about 4,000 feet.

The ranges of mountain and valley which mark this region are "parallel to one another and to the St. Lawrence, and the whole coincide with the strike of the formations constituting the district. The streams conveying the waters of the area to the Great River, are first the Richelieu and the Yamaska, the main trunks of which run in a direct continuation of the valley of Lake Champlain, with a distance between them equal

to about the greatest breadth of the lake, and go with the strike, while the eastern branches of the Yamaska, (including the most southern of them bearing the name of the stream,) all of which have their sources west of the Green Mountain range, or among its peaks, run transverse to the stratification. Next are the St. Francis and the Chaudière, about eighty miles asunder, the lower part of each of which makes a straight section across the measures, including rocks constituting the mountain range, while their upper parts drain the line of valley beyond. The upper part of the St. Francis and its tributary the Massawippi, flowing in opposite directions along the foot of the mountain range, occupy about eighty miles of the line in the general strike of the formations, and join at Lennoxville, after being supplied by several transverse tributaries, which take their sources in the southern mountains. The Chaudière, springing in these mountains, overlaps the upper part of the St. Francis, flowing in an opposite course, and more southern but parallel line for some distance below Lake Megantic. It then turns up northward, and is joined by the Rivière du Loup, which flows across the measures in the same direction as the lower part of the Chaudière, and further on it meets another tributary called the Famine. This tributary is in the same relation to the rocks of the country as the upper part of the St. Francis and the Massawippi. Flowing in the strike, it takes its source to the eastward, in a level tract, which is also the source of the Mitaywaquon, and constitutes part of the valley of the St. John River, to which this is tributary; and it appears probable that the valley of the St. John, presenting a continuation of the line of valleys, will be found to display the same relation to the stratification as that portion of the depression to the south-west already mentioned. Between the St. Francis and the Chaudière, are the Bécancour, and the east and west branches of the Nicolet. These take their rise toward the south-east side of the mountainous belt of country. The course of the two Nicolets is in general transverse to the measures, more directly so in the parts which flow among the

mountains; that of the Bécancour is more irregular, being sometimes with and sometimes transverse to the strata for long stretches. The main source is about midway between the Chaudière and the St. Francis, but leaving on the hilly tract, the stream approaches to within 20 miles of the former, while its mouth is not much over the same distance below the latter.

These various tributaries of the St. Lawrence and their ramifications, by which the district is very abundantly watered, often spread out into small but beautiful lakes among the high lands, giving, in association with mountain peaks, great picturesqueness to the scenery. This is particularly the case towards the south-western parts, where these lakes so bespangle the country that in one panoramic view from the summit of Orford Mountain, estimated at 4,500 feet above the St. Lawrence, no less than eighteen of them can be counted, emptying into the Yamaska and Richelieu on the one hand, and the St. Francis on the other. The largest of these is Lake Memphramagog, which has a length of about 25 miles, by a breadth generally under one mile, but sometimes two; it lies partly among the mountains and partly in the valley beyond, which obliquely crosses the upper extremity, and in one place the lake approaches to within six miles of Stanstead Plains. Each branch of the Nicolet is supplied with its lake among the mountains." "The Bécancour displays a very beautiful chain of lakes in the Townships of Inverness, Halifax, and Ireland; while others, of a smaller size, on the north-west line of Wolfetown, appear at the sources of the stream, situated similarly in geological regard as those of the Nicolets." Several of these, with others named, are taken in one view from the summit of the White Mountain. (Geological Report for 1847–48, pp. 6–8.)

"The plains of the north-west and the vale on the south-east of the mountain belt," Mr. Logan goes on to say, "constitute two valuable tracts of country, of great agricultural capability. The soil of the former, though in some places light, is for the most part a strong calcareous clay, supporting, in its

wild state, a predominating growth of soft wood, but when cleared, well suited to yield abundant crops of excellent wheat, for which the Seignorial farms along the St. Lawrence were formerly celebrated. The soil of the south-eastern vale is, with many exceptions, generally a gravelly loam, seldom deficient in calcareous quality, and often very ferruginous; its timber is chiefly hardwood. It is well adapted for wheat." Mr. Logan remarks that the distance of this region from market had caused attention to be turned chiefly to the rearing of cattle. By the passing of the St. Lawrence and Atlantic Railroad through this splendid country, (through which I have travelled repeatedly,) the difficulty spoken of is now entirely removed, and Boston and Montreal brought within a convenient distance.

Much of this region is yet to clear, though it is fast being brought under cultivation.

For the geological description of it, the reader is referred to Mr. Logan's Report above quoted, pp. 10–58.

Its Economic Materials are magnetic and specular oxydes of iron—which are specially abundant in Sutton and Brome;—bog iron ore and iron ochre; chromic iron; bog manganese or wad; copper ore, and gold, which is found in the vicinity of Sherbrooke, associated with copper pyrates, the quantity being, however, very small. In his Report for 1851–52 (pp. 21–27), Mr. Logan describes a visit which he paid to a Placer which was being wrought in the bed of the Rivière du Loup, about ten acres from its junction with the Chaudière, whence during the week of his stay, a quantity was obtained valued by him at £31 3s., at an expense of £15 for labour. The deposit was thus yielding double wages. The auriferous drift has since been found to extend over an area of 10,000 square miles. (Report, 1852–53, p. 71.)

Mr. Logan represents the country between the Chaudière and the Temiscouata Road as being inferior to that between the Chaudiere and the Richelieu, not presenting an equal breadth of Champaign margin, and being more rocky. The

general strike of the strata is with the river, particularly with the north side, though in consequence of a multitude of anticlinal axes there is the appearance of its being with the mountainous belt behind.

The rocks met with, in ascending series from the Trenton Limestone and Utica Slate are :—

1. A series of dark clay-slates, interstratified with grey, thin-bedded sandstones, often calcareous, weathering yellowish-brown, and with grey yellow-weathering limestones. This series is fossiliferous, holding shells and graptolites, and appearing to be terminated by a set of bituminous shells and black limestones.

2. A series of grey-green, and occasionally red shales with thin calcareous layers.

3. A deposit of hard Sandstones, varying in colour from light grey to iron grey, and sometimes slightly greenish, which appear to hold but little mica.

4. Red and green shales—the red of a chocolet hue; and the iron to which this is supposed owing frequently associated with titanium.

5. A series of coarse-grained green sandstones, holding more mica than the lower sandstones, and frequently presenting small spangles of plumbago.

These deposits occupy nearly the whole of the Champaign country east of the Richelieu, between the mountain belt and the St. Lawrence. All of them belong to the Lower Silurian. The distribution of these rocks is described in Mr. Logan's Report for 1849–50 (pp. 34–48), to which we refer the reader. Upper Silurian formations present themselves at Potton Ferry, Georgeville, and in Stoke Township, on Lake Aylmer, and in some other places.

The Economic Materials of this region are—Bog iron ore, copper ore, chromic iron, gold in several localities, manganese, flagging stones, roofing slates, and peat. (Report, pp. 64–72.) A deposit of peat extending over 4,000 square acres is met

with in the Seigniory of Rivière Ouelle, and another of about 6,000 acres in the Seigniory of Rivière du Loup, besides a patch of 100 acres on the left bank of the Madawaska on the road to the Little Falls.

Bouchette bears testimony to the mildness of the climate, and the advantages of the soil of the Eastern Townships. (Vol. I., p. 308.) In a Report presented (18th June, 1851) by a Special Committee appointed by the House of Assembly, to inquire into the causes which had retarded their settlement, the following language is used in relation to them :

"The Eastern Townships, properly so called, is that great extent of habitable and fertile country, contained between the Chambly and Chaudière Rivers, in one direction, and between the frontier lines of Maine, Vermont, and New Hampshire, and the Seigniories of the Districts of Montreal, St. Francis, Three Rivers, and part of Quebec, in the other. This vast territory promises to become, at no distant period, the richest, the most populous, and the most flourishing part of Lower Canada ; not only on account of its climate, milder than that of the shores of the St. Lawrence, of the immense extent of excellent and fertile soil which it includes, and of its abundant streams of water,—but also, and more especially, because that part of our fine country borders on the territory of our industrious neighbours, and must be traversed by the main lines of communication between the two countries, as by the Railroad from Montreal to Melbourne on the St. Francis, and from Melbourne to Portland on the Atlantic, and soon hereafter, we trust, by that from Melbourne to Quebec." These Townships contain, it is computed, 4,886,400 acres, capable, mostly, of being brought under cultivation. The exemption of the Townships from Seignorial burdens, and the extensive water power possessed are named by the Committee as reasons for believing that they are destined to become the seat of manufactures. Speaking of the comparative advantage possessed by the high lands over the lower, the Committee say,—" The trees stand far apart, and the land is cultivable, before the

stumps are rotted out. They are likewise naturally drained, so that in the very first year, after the labour of clearing is completed, a crop may be raised, often the best they ever yield; the soil makes a grateful and immediate return to its proprietor, for the preference by which he has distinguished it."—Several instances are given of the success that has followed the efforts of settlers. (pp. 10–18.)

The country lying between the Chaudière and the Mars Hill highlands, Bouchette describes as decidedly hilly, though abounding with extensive flats and valleys.—"The land," he says, "generally rises in irregular ridges from the borders of the river, towards the rear, and attains, in general, a considerable elevation, at the distance of 10, 15 and 20 miles from the front, forming at its height the verge of a broad and extended tract of table-land of gentle descent towards the river St. John, beyond which it reascends again, and acquires a superior degree of altitude, towards the sources of the Allegash, merging in the range of highlands that are a continuation of the Connecticut range, stretching easterly, and winding round the sources of the rivers falling into the Atlantic, and those flowing into the St. Lawrence, and the St. John, in the opposite direction."

This region is well-watered. Its chief rivers are, the St. John and its principal branches, the Madawaska, Echimin, Du Sud, Le Bras (a branch of the Du Sud), Ste. Anne, Ouelle, Du Loup, the Green River, Trois Pistolles, Rimouski, and the Great Mitis, and Matane; its chief lakes, the Metapediac, Mitis, Temiscouata, Long Lake, and Eagle Lakes. (Vol. I., p. 313, 314.)

The District of Gaspé is a peninsulated tract of country, lying between 47° 18′ and 49° 12′ North, and 64° 12′ and 67° 53′ West;—bounded on the North by the St. Lawrence, on the East by the Gulf, on the South by the Bay of Chaleurs, and on the West by the district line dividing it from Quebec. Its coast, extending from Cape Chat to the head of Ristigouche Bay, comprehends, including the numerous bays which

indent it, a space of about 350 miles. Its greatest width from north to south is about 50 miles.

Speaking generally, the face of the country in this district is uneven. In some places it is mountainous, with irregular valleys intersected by deep ravines intervening between them. Bouchette states the mass of the lands to be, nevertheless, well adapted to agriculture. With the exception of some of the higher hills, that are thinly clad with a diminutive growth of timber, the country is, according to him, very well wooded, the forests chiefly consisting of maple, beech, pine, larch, white cedar, spruce, and hemlock. There is a deficiency of oak both as to quantity and quality. (Vol. I., 323, 324.)

The Magdalen Islands, chiefly important on account of their fisheries, are annexed to the district and county of Gaspé.

The chief rivers of the district of Gaspé are the Matan, the Ste. Anne, and the St. John.

The Matan, which falls into the St. Lawrence in latitude 48° 51′ N., longitude 57° 33′ W., takes its rise in the country to the north of the Notre Dame Mountains, and, with its tributaries, drains an area of 800 square miles. The Ste. Anne, which drains an area of over 300 square miles, enters the St. Lawrence in Lat. 49° 10′ N., Long. 66° 28′ W., eleven miles below Cape Chat. The St. John, which has at its mouth a wide open bay, occupying an area of from two to three square miles, falls into the bay of Gaspé in Lat. 48° 46′ N., Long. 64° 30′ W. It has four considerable tributaries.

One of the most remarkable features of the Gaspé Peninsula is the chain of Notre Dame Mountains, which varies in width from two to six miles, and in height from 2,000 to 3,778 feet. Of the general character of this range notice has already been taken. (See further Geo. Report for 1845–46, pp. 99-110.)

The rocks of this region are stated by Mr. Murray (Report above referred to, p. 111) to be—

1. Red and green Shales, black and dark-green Shales, with calcareous bands, and brecciated Limestone.

2. Metamorphic Rocks of the Notre Dame Mountains.
3. Gaspé Limestone and Shales.
4. Gaspé Sandstones.

Before proceeding to the consideration of the Soil, Climate and Natural Productions of Canada, we must for a few moments recall the reader's attention to the St. Lawrence.

From Lake Ontario the River issues in "so broad and beautiful a stream, that it assumes the appearance of a lake for 39 miles, which is so singularly studded with a multitude of islands, that it has been denominated the Lake of the Thousand Islands." As ascertained by the surveyors employed in establishing the boundary, under the Sixth Article of the Treaty of Ghent, there are 1,692 of them, "forming an inextricable labyrinth of islands, varying in magnitude, shape and aspect, and presenting the most extraordinary and pleasing vistas and perspectives, in which the rapid and magic combinations of the kaleidoscope seem naturally exhibited."

The chief impediments to the navigation of the St. Lawrence are the Rapids between Johnston and Cornwall (though the descent is on the whole only 75 feet in 39 miles), and at Lachine. It is, however, chiefly in coming up that difficulty occurs, if not solely. The steamers, with which the River is covered, pass down through the whole of them without trouble or danger. Nothing can well be more pleasant than the excitement produced by the velocity with which the traveller finds himself hurried along through the foaming waters. In the beginning of June last I passed the Lachine Rapids when the light was just departing, and in the midst of a tremendous thunderstorm, accompanied with lightning the most vivid and with torrents of rain. The scene was one of the most sublime it has fallen to my lot to witness. As we shall see by-and-by the difficulty just adverted to is overcome by canals, of which we may be forgiven for being proud.

Before reaching Montreal, the St. Lawrence passes through the Lakes St. Francis and St. Lewis, which form expansions

of it. Though of no great depth, they "form an agreeable variety, much heightened by the many pretty islands scattered about them. St. Francis is 25 miles long by 5½ broad. The shores in some places are marshy, as they do not rise much above the level of the water. St. Lewis is formed at the junction of the Ottawa with the St. Lawrence; it is 12 miles long by 6 broad. Between these Lakes a sudden declivity in the bed of the river, obstructed by rocks in some places, and scooped into cavities at others, produces the most singular commotion called the Cascades; it is an extraordinary agitation of the waters precipitated with great velocity between the islands, which being repelled by the rocks and hollows underneath, the waves are thrown up in spherical figures much above the surface, and driven with the utmost violence back again upon the current, exhibitiug nearly the same effect as would be produced by the most furious tempest." The Lake of the Two Mountains—an expansion of the Ottawa, about 24 miles in length and varying from one to six in breadth—"merges in a manner into Lake St. Louis. At the confluence of the two rivers are the Islands of Montreal, Isle Jesus, Bizarre, and Perrot." The Lachine Rapid, noticed above (Sault St. Louis), is at the lower end of Lake St. Louis.

Lake St. Peters, 25 miles long and nine broad, with a group of islands which covers about nine miles of its western surface, is situated near William Henry, or Sorel, about 145 miles below Montreal. At three Rivers, 45 miles below William Henry, or Sorel, the tide of the St. Lawrence ceases to be perceptible. At the Richelieu Rapid, about 52 miles further down, the bed of the river is somewhat contracted or obstructed by large masses of rock, which leave but a narrow channel. From this spot the height of the banks increases on to Cape Diamond, the site of the City of Quebec. (Bouchette, Vol. I., pp. 156–157, 161–164.)

"From Cape Diamond," says Bouchette, "and from Point Levi on the south shore, one of the most striking panoramic views perhaps in the whole world offers itself to notice; the

assemblage of objects is so grand, and though naturally, yet appear so artificially contrasted with each other, that they mingle surprise with the gratification of every beholder. The Capital rising amphitheatrically to the summit of the Cape, —the river St. Charles flowing in a serpentine course, for a great distance, through a fine valley, abounding in natural beauties,—the Falls of Montmorenci,—the Island of Orleans, —and the well-cultivated settlements on all sides, form together a *coup d'œil* that might enter into competition with the most romantic. At Quebec the St. Lawrence is 1,314 yards wide, but the basin is two miles across and three miles and three-quarters long: from the basin the river continues increasing in breadth until it enters the Gulf of the same name, where, from Cape Rosier to the Mingan settlement on the Labrador shore, it is very near 105 miles wide." (Ibid, 165.)

The Island of Orleans divides the river just below Quebec into two channels, the one to the south being that which is used. About 25 miles below Quebec the waters of the river begin to be brackish, and become perfectly salt at Kamouraska, 75 miles lower down. Between the Island of Orleans and the Gulf there are a number of islands, one of the more important of which is the Bec, 153 miles from Quebec, where pilots are taken. The Traverse, where the Channel is contracted into a space of 320 yards, is met with beyond Rivière du Sud. At its mouth the St. Lawrence is once more divided into two channels—to wit, by the Island of Anticosti, which is 125 miles long, with a breadth at its widest part of 30 miles. (Ib., 165–168.)

"Taking into account its beauty," says Mr. Buckingham, (p. 30), "as well as its length, the romantic passage among the Thousand Isles, between Kingston and Montreal,—the size of its Lakes,—the magnificence of its Cataracts and Rapids, from Niagara to the Chaudiere, Montmorenci, and Ste. Anne's,—and the gigantic scale of its opening into the sea,—the St. Lawrence is, beyond all question the most magnificent river in the world. Neither the Amazons,

the Plata, nor the Orinoco of South America, the Missouri or the Mississippi of North America, the Niger or the Nile of Africa, the Ganges, the Indus, the Tigris, or the Euphrates in Asia, or the Danube, the Rhine, or the Vistula in Europe, can either of them present so remarkable a combination of objects of beauty and grandeur."

SOIL OF CANADA.

In a country of such extent as Canada, there will, of course, be found considerable variety of soil; but if the testimony of men who cannot but be admitted to be competent judges is to be taken, its general character must be recognised as standing very high. To the incidental notice taken already of this point in the general description of the country,—which removes, we conceive, the necessity of any lengthened remarks now,—we would add a few extracts from the Reports of Mr. Hunt, the accomplished Chemical Associate of Mr. Logan.

For the Analyses of the Soils we refer the reader to the Reports (1849–50, pp. 73–100; and 1851–52, pp. 100–111), as we shall confine ourselves to the general statements by which these are accompanied.

SOILS OF CANADA EAST.

Of three samples examined from St. Charles, Mr. H. says—"In their virgin state, the lands of this Seigniory consist principally of a light greyish or yellowish clay with reddish stains, often more or less mixed with sand and overlaid with a light black vegetable mould, averaging perhaps ten or twelve inches in thickness. The original growth was of hard wood, maple, elm, and birch, except upon small ridges of gravel occasionally met with, which are clothed with resinous trees. By tillage the soil gradually loses its blackness, partly from the decomposition of the vegetable matter, and partly from the intermix-

ture of the inferior clay. Many of the farms have been cropped with wheat for thirty or forty years almost without alternation or fallowing, and owing to this, and to the ravages of the fly, have for a few years past yielded but comparatively inadequate returns. They produce, however, good crops of peas and oats, and the cultivation of timothy and clover has of late years been found very successful."

Of the soils of St. Hilaire, he writes, "the clays which I saw in this Seignory seem much like those of St. Charles, but with a smaller admixture of sand. Around the base of the mountain the *debris* of the decomposing trap, has made a band of gravelly earth well fitted for fruit and for those crops which require a light warm soil. The compact texture of these very heavy clays, washed by the waters flowing from the hill side, is such as to require thorough sub-soil draining, which has been effected in admirable manner by the proprietor, Major Campbell, to whose kind courtesy I am much indebted, and whose enlightened efforts are making his farm a model to the district. Thus drained, the clays are found to yield excellent crops of wheat and clover, with peas."

The soils of the Seigniory of Chambly, Mr. Hunt says, "are principally of a reddish clay, which, when exposed to the air, readily falls down into a mellow granular soil. In the places where I had an opportunity of observing, it is underlaid at the depth of three or four feet by an exceedingly tenacious blue clay which breaks into angular fragments, and resists the action of the weather. The upper clays constitute the wheat-bearing soils, and were originally covered with a growth of maple, elm, and birch." Distinguished from these by its covering of soft woods, principally pine and tamarack, is a gravelly ridge, of which he speaks, thickly strewn with gneiss and syenite boulders much worn and rounded, which "yields good crops of maize and potatoes, by manuring." The extraordinary fertility of the soil is indicated by the fact that there are fields of which Mr. H. was assured by the proprietors that they had "yielded successive crops of wheat for thirty and

forty years, without manure and almost without any cultivation."

In relation to the lands of St. Dominique, where there is a great prevalence of peat—(one tract extending five or six miles in one direction by three or four in another, with a depth of from two to six feet, and, as is reported, in some places even eighteen)—it is stated that when brought in by repeated burnings, and plowings, "a rich mellow soil is obtained, which is unsurpassed for wheat, and yields at the same time fine Indian corn, peas, and grass. Such are many of the reclaimed lands of the Savanne, near to St. Hyacinth, where from an original peat of four or five feet, the finest farms have been made, yielding rich timothy and clover, alternating with wheat and peas." The peat ash is described by Mr. Hunt as being, from its composition, a powerful fertilizer. "It contains more than two per cent. of gypsum, besides the alkaline sulphates and chlorids, carbonates and silicates of lime and magnesia, all substances eminently conducive to the growth of plants."

The clays of Ste. Anne de la Pocatière and the adjoining parishes are "generally greyish or bluish, often stained with yellow and red, and crumble when exposed to the weather into a fine, mellow, and very fertile soil; they are often underlaid by a heavy blue clay, and sometimes by beds of gravel and boulders, furnishing a natural drainage."

"Over a large part of the district of Johnson, the almost horizontal strata of the calciferous sand-rock (passing in some cases into the overlying and underlying formations) are covered with a layer of earth, generally from a few inches to a foot or two in thickness, which, notwithstanding its scanty depth, forms a rich arable soil, covered with a fine growth of hard wood. It is a sandy loam, and appears to have been entirely produced by the disintegration of the underlying rocks, from which atmospheric waters have removed the calcareous cement."

SOILS OF CANADA WEST.

Respecting the land on the Grand River, Mr. Hunt speaks as follows :—"It consists, in its original state, of fine open plains, somewhat elevated, and may be defined as extending from Galt down the river for about eighteen miles. These plains support a fine growth of oak remarkably free from underwood, and are known by the name of 'oak openings.' The soil is a sandy loam, very uniform in its character, which at a depth generally of from two to six feet, is underlaid by a coarse gravel, thus affording a natural drainage. The crops of wheat obtained upon these lands are excellent, but wheat is seldom sown for two successive years; the fall grain is generally followed by a spring crop, and the field then sown down with grass or clover, and pastured for one or two years.

Potatoes and root crops, as beets and turnips, succeed equally well upon these plains, which under a careful system of rotation are very productive; but it may be remarked that they would never endure the systems of tillage which are practised upon the heavy clay lands of the valleys of the Richelieu and the Thames." Besides the ordinary product of the farm yard, gypsum, which is found in great abundance in this vicinity, is very advantageously employed as a manure, especially for clover.

Along the banks of the river, at a lower level than the oak openings, are fine alluvial *flats* of a rich heavy mould, covered in their natural state with a rich heavy growth, principally of elm, beech, and maple. The soil of these flats is scarcely adapted to wheat, which grows too luxuriantly, and is apt to suffer from rust, but it produces abundantly all the other crops of the upland."

"The rich alluvial flats of the valley of the Thames extend," Mr. Hunt says, "from the north branch of Bear Creek, on the north, to near Lake Erie on the south, constituting a large portion of the Western Peninsula. The land is quite

level, and requires draining to make it fit for successful culture. The soil may be described as a rich black mould, which along the Thames is from six to ten inches deep, but near Bear Creek is said to be very much thicker.

This, at the places where I examined it upon the banks of the Thames—(continues Mr. Hunt)—rests upon a yellowish or greyish clay,—often containing abundance of small shells,—which by exposure to the air darkens and crumbles down into a mellow granular soil. In some sections seen near to the village of Chatham, this clay was about four feet in thickness, and was underlaid by a more or less sandy loam, regularly stratified, while beneath at about ten feet from the surface, appeared a tenacious blue clay. The ordinary tillage rarely brings up the lighter sub-soil, but a plan of deep plowing has lately been adopted by some of the farmers with excellent results. The wheat sown upon the black mould grows too luxuriantly, and is disposed to rust, tendencies which are arrested by an admixture of the clay. There are fields near the river, in the Township of Raleigh, which I was well assured had been cropped with wheat for thirty or forty years, without manuring, and with very little attention to crop or fallowing, and yet these still yield very fair returns. Upon the best-conditioned lands thirty-eight to forty, and even forty-two bushels of wheat to the acre, are obtained in good seasons. Hemp has recently been tried with much success.

The newly cleared lands are frequently first sown with Indian corn, which grows luxuriantly, and preferring as it does a light open soil, succeeds perfectly well in the richest moulds. The crops of oats and barley are also very fine, potatoes succeed well, and mangel-wurtzel and carrots are beginning to be cultivated for the feeding of stock.

The natural growth of these lands is oak, elm, with black walnut and whitewood trees of enormous size; the black walnut timber is already becoming a considerable article of export.

Fine groves of sugar maple are also met with, from which large quantities of sugar are annually made."

"Near the mouth of the Thames, and skirting the borders of Lake St. Clair, is an extensive prairie, which is supposed to cover about 30,000 acres." Its natural growth consists of "soft maple, walnut and elm, with occasional willows, which are seen springing up here and there in copses, with thorns." In some places there is a coarse sedge, in others a stout-jointed grass, sometimes attaining the height of three feet, which "makes good hay and pasturage for the half-wild poneys which feed in great numbers upon these prairies."

These lands are liable to overflowing in spring. Mr. Hunt states that though the cultivation of grass has been "too much neglected;" "clover has been a few times tried, and great crops obtained." A judicious use of lime would, he thinks, be of service in correcting the too great richness of the soil in vegetable matter.

In Mr. Hunt's opinion, the different soils of the Province may be "comprehended, with few exceptions, in six groups, which are as follows:—

1. Marine clays of the St. Lawrence valley, sometimes calcareous.
2. Clays of the Western basin, also calcareous in part, and probably lacustrine.
3. Drift from the crystalline rocks of the north, which in the western portions of the Province, is in some parts intermixed with the detritus of the Silurian formation.
4. Drift and *debris* derived from the Metamorphic rocks of the Eastern Townships.
5. Soils produced by the disintegration of the red Slates displayed on the south shore of the St. Lawrence below Quebec.
6. Soils from the disintegration of the calcareous Sandrock, occupying some portions of the Johnstown District."

CLIMATE OF CANADA.

So many causes contribute to modify climate, that a correct idea of it in any particular region can never be gathered from mere latitude. For a general statement of these see Humbolt's Cosmos, Vol. I., pp. 325, 326 (Bohn). The limits to which we feel ourselves confined, forbid our attempting more than such a notice of leading facts as may put it in the power of the intelligent reader to form a fair idea for himself.

With this view we beg to present him, in the first place, with the following Table extracted from the *Canadian Almanac* (Maclear & Co.'s, formerly Scobie's), for 1855, p. 28.

Mean Results of Meteorological Observations at St. Martin, Isle Jesus (9 miles from Montreal), for 1853, *compiled from Tables published by Dr. Smallwood in "Canadian Journal" :—*

Month.	Thermometer.				Barometer.			
	Monthly Mean.	Highest Temperature.	Lowest Temperature.	Monthly Range.	Monthly Mean.	Highest Barometer.	Lowest Barometer.	Monthly Range.
January.....	16.68	42.0	-28.7	70.7	29.757	30.382	28.635	1.747
February	16.36	43.0	-18.0	61.0	29.654	30.089	28.938	1.151
March	29.68	57.0	- 6.0	63.0	29.584	30.202	28.902	1.300
April.....	41.36	80.0	21.0	59.0	29.654	29.965	28.735	1.230
May.....	56.34	87.9	30.0	57.9	29.644	30.103	29.302	0.801
June	68.66	99.2	39.0	60.2	29.648	30.070	29.277	0 793
July.....	68.04	96.4	46.5	39.9	29.479	29.795	29.115	0.680
August	68.61	96.2	43.3	42.9	29.598	29.913	29.664	0.649
September.....	58.04	94.0	27.3	66.7	29.325	29.652	28.911	0.741
October	43.37	69.5	23.0	46.5	29.500	29.853	29.113	0.740
November	31.00	61.0	00.0	61.0	29.637	30.147	28.930	1.217
December.....	16.56	41.0	-21.5	62.5	29.456	29.793	28.843	0.950
Mean	42.89			57.6	29.578			1.000

The following additional particulars are from Dr. Smallwood's own Report in the *Canadian Journal*, April, 1854 (the article whence the above is derived) :—

The Mean Humidity (saturation being 1·000) was in Jany., 909; February, 906; March, 881; April, 858; May, 895; June, 739; July, 727; August, 741; September, 834; October, 855; November, 798; December, 759. The yearly mean was 825.

Rain fell on 99 days, amounting to 44·201 inches, and was accompanied by thunder and lightning on 17 days. The greatest amount observed fell in September, beginning 5.10 p.m. of the 14th, and continuing till 5.40 p.m.,—the quantity reaching 5·142 inches. *Snow* fell on 37 days, amounting to 116·81 inches on the surface. The first snow of the winter 1852–3 fell on the 17th October, 1852; the last, 14th April, 1853. The whole amount of snow during the winter was 119·10 inches. The river Jesus was frozen on the 28th day of November. The last steamer left Montreal (on the St. Lawrence) on the 7th December; the first steamer arrived at Montreal on the 15th of April.

The amount of evaporation was measured regularly from the 1st of April to the 31st of October, and amounted in April to 1·80 inches; May, 2·51; June, 3·41; July, 3.98; August, 3·16; September, 2·23; and October, 2·31.

The most prevalent Wind during the year was W.S.W.; the *least prevalent* was the East. In the Winter quarter the most prevalent wind was N.E. by E., and the least S.; in the Spring quarter the most prevalent was N.E., the least so S.; in the Summer quarter the most prevalent was W.S.W., and the least N.; in the Autumn quarter the most prevalent was W.N.W., and the least E. The greatest velocity of the wind was on the 14th of March, and was 32·60 miles per hour.—The yearly mean of the maximum velocity was 15·81 miles per hour; the yearly mean of the minimum velocity was 0·32 miles per hour. The quarterly means were as follows: Winter, Maximum velocity, 17·93; minimum, 0·25. Spring—Maximum, 16·68; minimum, 0·81. Summer—Maximum, 11·23; minimum, 0·29. Autumn—Maximum, 16·13; minimum, 0·18.

Crows were first seen on the 17th March; Wild Geese, *Anser Canadensis*, on the 30th day of March; Swallows, *Hirundo rufa*, on the 1st April. Shad, *Alosa*, were first caught in this neighbourhood on the 30th May; Fire-flies, *Lampyris Corusca*, were seen on the 10th day of June; Frogs, *Rana*, were first heard on the 23rd of April.

The Aurora Borealis was visible on 39 nights.

The atmosphere has *daily* afforded indications of electricity varying in intensity, and kind; the highest *tension* has been *generally* noticed in the Winter season.

From the Tables which follow, compiled from those published by the Provincial Observatory, Toronto, (under the Superintendence of Professor Cherriman,) an idea may be formed of the climate of Canada West. They have a reference to the same year, and are copied from the *Canadian Almanac* for 1855 :—

THERMOMETER.

Month.	Mean Temperature.	Difference from Average.	Thermic Anomaly.	Highest Temperature.	Lowest Temperature.	Monthly Range.	Mean Daily Range.	Greatest Daily Range.
	°	°	°	°	°	°	°	°
January ..	28.98	—1.99	—9.8	40.9	—9.7	50.6	14.16	40.9
February .	24.06	+0.66	—10.6	43.4	—1.4	44.8	14.40	35.4
March	30.65	+0.42	—9.5	56.3	—0.1	56.4	14.82	26.0
April.....	41.92	+0.78	—8.3	65.7	25.0	40.7	14.07	28.8
May.....	50.87	—0.31	—7.2	78.4	32.2	46.2	14.19	24.4
June	65.49	+4.44	+0.9°	89.5	39.2	50.3	19.77	32.8
July.....	65.60	—0.81	—3.1	91.3	41.6	49.7	23.80	30.7
August....	68.61	+2.45	+0.1	94.9	42.5	52.4	21.41	39.1
September	58.81	+0.79	—2.7	85.5	33.9	51.6	18.42	32.2
October ...	44.40	—0.53	—9.4	64.7	23.4	41.3	20.51	31.5
November	38.68	+2.17	—4.5	55.6	12.8	42.8	13.01	27.6
December	25.32	—1.43	—10.7	46.4	—8.4	54.8	14.14	24.7
Mean	44.78	+0.55	—6.2			48.47	16.8	

Month.	Barometer. Mean Height.	Highest Barometer.	Lowest Barometer.	Monthly Range.	Air. Mean Humidity.	Mean Elasticity.	Mean of Cloudiness.
January	29.7121	30.315	28.653	1.662	.82	0.110	0.68
February.....	29.5824	29.937	29.074	0.863	.82	0.117	0.74
March.....	29.5533	30.168	28.892	1.276	.81	0.145	0.59
April	29.5689	29.974	28.985	0.989	.80	0.212	0.46
May	29.5979	30.074	29.213	0.861	.80	0.297	0.57
June.....	29.6175	29.982	29.265	0.717	.79	0.491	0.43
July	29.6552	29.916	29.274	0.632	.70	0.425	0.34
August.....	29.5907	29.850	29.300	0.550	.74	0.513	0.47
September	29.6421	29.999	28.946	1.053	.79	0.399	0.53
October	29.6485	30.066	28.985	1.081	.75	0.223	0.49
November.....	29.7921	30.270	29.159	1.111	.81	0.201	0.74
December	29.5984	29.984	28.952	1.032	.81	0.122	0.75
Mean	29.6299			0.986	.79	0.271	0.57

Month.	Wind. Mean Direction.	Mean Velo. (miles.)	Rain. Amount, (inches).	Difference from Average.	Amount of Snow.	No. of Fair Days.
January	N. 27. W.	6.34	0.290	—1.535	7.5	24
February....	N. 49. W.	7.29	1.030	+0.023	12 6	9
March	N. 62. W.	5.87	1.080	—0.481	7.1	17
April	N. 12. W.	5.20	2.625	+0.023	1.0	19
May	N. 20. W.	5.14	4.420	+1.534	Inapp.	13
June	N. 14. W.	3.67	1.550	—1.532		21
July.....	E. 14. S.	3.70	0.915	—2.726		21
August.....	E. 61. S.	4.23	2.575	—0.415		20
September..	N. 5. E.	4.30	5.140	+0.839		18
October.....	W. 2. S.	4.72	0.875	—2.198	Inapp.	19
November...	N. 1. E.	5.52	2.425	—0.628	2.7	9
December...	N. 38. W.	4.98	0.625	—0.944	22.3	14
Mean.....	N. 38. W.	5.08	23.550	—8.076	53.2	204

The particulars which follow are from Professor Cherriman's Register (for the same year),—contained in the *Canadian Journal* for March, 1854—the source of the above.

The mean Temperature for the year 1853 has been above the average of the previous twelve years by 0·55, the months of January, May, July, October, and December having been below, and the remaining months above the corresponding average temperature. The hottest month was August, and the coldest January, which is an exception to the normal curve where these months are July and February.

The month of August is the hottest in the whole series of years, except July 1850. The *climatic difference*, or the difference between the hottest and coldest months, is 45·6, being 2·9 greater than the average. The range of temperature during the year has been 104·6, occurring from—9°.7 on the morning of January 16th to 94°.9 on the afternoon of August 11th, this latter being the highest temperature ever recorded at the Observatory.

The hottest day was August 12th (79°.8), and the coldest Dec. 29th (2°.4) ; the difference between these being 77°.4. The greatest daily range occurred on January 15th, amounting to 40°.9, while the mean daily range on the average of the whole year was, 16°.9.

The Indian Summer was well defined from 12th to 20th October.

The number of thunder storms during the year has been 34, of which the most occurred in June and September ; none at all in November, January, and February. Of these, there were only six remarkable for violence. The most violent was on 14th September, during ten minutes of which the wind attained a velocity of 46·8 miles per hour, the greatest ever recorded here.

During the year there have been 233 nights, the state of which would have permitted Aurora to have been seen if it existed. On 57 of these Aurora was actually observed. The most brilliant displays occurred from May 28th to June 1st ; from July 8th to 12th ; on August 25th ; and from September 1st to 3d. This latter was visible not only over most of the Continent, but also in Europe, presenting the same cha-

racteristics. All these were accompanied by great magnetic disturbance.

The reader must be left to compare these Tables from the two ends of the Province for himself, as space forbids our doing it. Could we have presumed so much on his patience, we should have liked to present a set of similar Tables of Observations made by Dr. Craigie at Hamilton; but all we dare further venture upon are a few extracts from Professor Hind's very admirable "Comparative View of the Climate of Western Canada,"—premising that his statements have a reference to that portion of the Province which lies south of the 44th parallel of latitude.

"The ameliorating influence of the Great Lakes upon the Winters of Western Canada, will appear upon inspection of the subjoined Table, containing the mean Winter temperatures of various localities situated on their shores, and at considerable distances from them, towards the East and West:

Places.	Latitude.	Mean Winter Temperature.	No. of Observations in Years	Approximate Mean.	
	°	°	°		°
Council Bluffs.....	41.25	22.5	5	West of the Lakes.	20.5
Fort Crawford.....	43.3	19.89	2		
Fort Howard.....	44.40	18.8	4		
Toronto.....	43.39	25.51	10	On the Lakes.	27.67
Lewiston	43.15	30.02			
Rochester	43.8	27.5	10		
Utica	43.7	24.8	14	East of the Lakes.	24.4
Albany.....	42.39	26.6	17		
Concord	43.12	22.5	10		

It is shown in the following Tables, that the intensity of occasional low temperatures is also greater at localities situated at some distance to the East or West of the Lakes, than within a few miles of their shores; and also, that a difference of one, two, or even three degrees of latitude to the South, does

not affect this general law. Though lowering tendencies exist in Western Canada at a distance of 20 to 30 miles from the Lakes, since the distance of the most inland portion of the country is not more than 50 miles from Lakes Huron, Erie, or Ontario, their warming influence will still be felt there, though in a less degree than on their shores.

Table of Minimum Winter Temperatures, observed at various Places, East, West, and on the shores of the Lakes, (1849) :—

	Names of Places.	Latitude.	January.	February.	December.
		°			
On the Lakes.	Rochester	43.07	— 9	— 7	2
	Lewiston	43.09	2	— 4	6
	Toronto	43.39	— 4	— 9	— 6
East of the Lakes.	Albany, N.Y.	42.39	—10	— 7	5
	Lambertville, N.J.....	40.23	— 6	— 3	18
	Beddeford, Me.	43.31	— 8	—19	— 7
	Providence, R..I	41.49	— 4	— 1	7
W. of the Lakes.	Muscatine, Ia.....	41.30		—22	—12

To the East and West of the Lakes (especially in the latter direction), high Summer means of temperature are invariably associated with low Winter means. Compare the following :

Places.	Latitude.	Winter Mean.	Spring Mean.	Summer Mean.	Autumn Mean.
	°	°	°	°	°
Toronto	43.39	25.33	41.61	64.51	47.41
Hudson	41.15	25.70	48.20	69.20	46.40
Muscatine	41.26	25.80	49.90	69.00	49.30
Council Bluffs.....	41.28	24.28	51.60	75.81	52.46
Fort Crawford	43.03	20.69	48.25	72.38	48.09
Fort Winnebago.....	43.31	20.81	44.67	67.97	46.10
Fort Dearborn.....	41.50	24.31	45.39	67.80	47.09
Detroit	42.62	27.62	45.16	67.33	47.75

We can add only the following

Table of the Mean Summer Temperatures at various localities in Europe, compared with those at Toronto.

	Mean Summer Temp. °
Toronto	64·51
Berlin (Europe)	63·2
Cherbourg "	61·9
Penzance "	61·8
Greenwich "	60·88
Cheltenham "	60·04

	Mean Temp. of the Hottest Months.
Toronto	66·54
Paris	66·02
Frankfort-on-the-Maine	66·00
Berlin	64·4
London	64·1
Cherbourg	63·2

The foregoing Tables should, we think, be sufficient to convince the intelligent reader, that Canada has got, instead of a very terrible, a very fine climate—one that will bear a not unfavourable comparison with the most admired.

Professor Hind holds the climate of Canada West to be superior to those portions of the United States lying north of the 41st parallel of latitude, in mildness; in adaptation to the growth of certain cereals; in the uniformity of distribution of rain over the agricultural months; in the humidity of the atmosphere; in comparative immunity from spring frosts and summer droughts; in a very favorable distribution of clear and cloudy days, for the purposes of agriculture; and in the distribution of rain over many days; as also in its salubrity.

In the following points he regards it as differing favorably from that of Great Britain and Ireland, viz-, in high summer means of temperature; in its comparative dryness; and in the serenity of the sky.

"In point of salubrity," says Bouchette, "no climate in the

world can perhaps be found to exceed that of Canada, which is not only a stranger naturally to contageous disorders or fatal epidemics, but extremely conducive to longevity." (Vol. 1st, p. 344.)

"After two years' residence in Upper Canada," says Gourlay, "I am inclined to think the world does not contain a spot more healthy, or altogether more desirable as to climate and soil." (Vol. 1st, p. 144.)

"The climate of Upper Canada," Talbot declares, Vol. 2d, p. 157, "although verging towards the extremes of heat and cold, is very fine, highly favourable to the growth of grain, and the production of the finest fruits."

NATURAL PRODUCTIONS OF CANADA.

The mineral products of Canada have been already noticed, possibly at too great length, though we trust their importance will be held to justify the attention bestowed on them. In connection with the general description of the various portions of the country, as also of its soils, the products of our forests, and our leading agricultural products have been brought into view. Both of these will come up before us again, when dealing with the subjects of Agriculture and Commerce. On these accounts we shall confine ourselves here to points not already touched on, and not coming naturally under any of the topics remaining to be considered.

The following are among the more common fruits, though all do not succeed equally well in every part of the country, viz.:—Apples and pears in great variety (70 varieties of the former, and 30 of the latter, were exhibited by Mr. G. Leslie, of Toronto, at the Agricultural Show in 1852); peaches, nectarines and grapes, of which Bouchette states that they seem to have found their native soil in the Niagara district; cherries, plums, and currants succeed in every part of the country, and gooseberries in not a few; strawberries also thrive well; apricots may likewise be named.

Sarsaparilla, spikenard, gold thread, elecampane, lobelia, blood-root, ginseng, and snake-root are named by Gourlay as natives of Upper Canada; also spearmint, hyssop, wormwood, winter-green, water-cresses, penny-royal, catnip, plaintain, burdock, horehound, motherwort, mallows, and many other aromatic and medicinal plants. He mentions also elder-berries, raspberries, blackberries, whortle-berries, and cran-berries. The juniper is likewise common. Sunflowers are met with everywhere, and splendid specimens of the castor-oil plant in many places; one of the former about ten feet high, with a head 18 inches in diameter, was exhibited by Mr. G. Leslie in 1852. Tomatoes abound over the country, with melons and squashes in great variety. Dwarf, French, and kidney beans "come to maturity with remarkable rapidity, and are at the same time very prolific." (Professor Hind.) The saffower, according to Professor Hind, attains dimensions which are rarely equalled even in Turkey, where it is largely grown.

An article in the *Canadian Journal* for October, 1852, descriptive of the Exhibition which had just been held in Toronto, closes with these words,—"the display of fruit, and flowers, and vegetables exhibited in a marked manner the extraordinary adaptation of the climate of this country to all the purposes of horticulture."

A list of indigenous plants found in the neighbourhood of Hamilton by Dr. Craigie and Mr. W. Craigie, is given in the *Canadian Journal* for April, 1854 (with their times of flowering), which contains over 300 species or varieties.

Though belonging perhaps more properly to the Natural History of the country, the following may be allowed a place here.

In an article by Mr. W. Couper, contained in the *Canadian Journal* for August, 1853, the undermentioned butterflies are named, with their times of appearing, to wit,—Camberwell beauty (we give only the common names), the black swallow-tail, clouded sulphur, orange comma, grey-vined white, tiger swallow-tail, small copper, black skipper, small spotted meadow brown, spring azure, the archippus, pearl-border fritillary,

banded purple, Baltimore fritillary. Of moths he specifies the great Saturnia, *Saturnia Polyphemus*, *Saturnia Prometheus*, ghost moth, royal tiger, buff leopard, twin-eyed hawk moth, panther, silver spotted buff, zebra hawk moth, grey hawk moth.

Dr. Cottle, of Woodstock, in an article in the *Canadian Journal* for April, 1854, suggests the probability of obtaining silk from the *Saturnia Polyphemus*, the *Saturnia Cecropia*, the *Saturnia Promethea*, and the *Saturnia Luna*, provided proper attention were directed to them.

George Allan, Esq. (the respected Mayor of Toronto), enumerates (*Canadian Journal*, March, 1853) the following land birds, met with by himself, as wintering in the neighbourhood of Toronto, viz., bald-headed eagle, snowy owl, horned owl, barred or grey owl, little horned owl, pigeon hawk, American shrike, Canada jay, blue jay, pine grosbeak, crossbill, pine linnet, the lesser red poll, the goldfinch, the titmouse, the tree sparrow, the snow bunting, the hairy woodpecker, the downy woodpecker, the red-bellied nuthatch, the cedar or cherry bird, the European wax-wing, the ruffled grouse, the spruce grouse, and the quail.

Dr. Hodder has two interesting articles in the *Canadian Journal* (April, 1853, and May, 1853), on poisonous plants found in the neighbourhood of Toronto; but we can do nothing more than direct the reader's attention to them.

Of the inhabitants of the forest, Gourlay enumerates the elk, the moose, the wolf, the bear, the wolverene, the wild cat or Canadian lynx, the catamount or tiger cat, the common deer, the otter, the mink, the fisher, the martin, the racoon, the wood-chuck or ground hog, the Canadian porcupine, the skunk, the weasel, the ermine or white weasel, the Canadian hare, and four species of squirrels, besides the bison and the buffalo, which have, he is disposed to think, withdrawn themselves, and the beaver, which, he conceived, might still be in the country when he wrote. (Vol. 1st, pp. 157-169.)

Among birds he names (besides some which we omit, as

having been already mentioned) the wild turkey, the wild goose, wild ducks, the *Canadian partridge*, the *Canadian robin*, the loon, the whipper-will, the mocking bird, the sawyer, the swan (rare, but seen and taken on the margin of Lake Erie), the heron, and the *Canadian cuckoo*, with a number of larks not, however, including the proper skylark. (Ibid., pp. 171-175.)

The sturgeon, mosquenonge, lake salmon, salmon trout, trout, white fish, pike, pickerel, bass, perch, cat fish, eel pout, dace, chub, mullet, carp, sucker, dog fish, bull fish, lamprey, silver eel, herring and sun-fish are described by the same writer as found in our waters. (Ibid, pp. 175-182.)

In concluding the Physical portion of our essay, to pass on to the Economic and the Social, a word or two may be allowed (and beyond this we shall not go) in relation to

CANADIAN SCENERY.

The sublimity of Niagara will be admitted by every one possessing a heart, who looks upon it; and the surpassing beauty of the Thousand Isles. While, however, these may claim the pre-eminence, they are far from standing alone. To say nothing of our Lakes (than a sail on which, on a fine summer's day, nothing can well be more delightful), our river scenery will vie with that of any country I have seen. Even with the scenery of the Ottawa, neither that of the Mississippi nor the Missouri is to be compared. The Grand River exhibits much beauty, especially in the neighbourhood of Paris and Galt, and between these two places on the south side. The spring and summer views in the neighbourhood of Dundas are exhilarating in a high degree; and that from Hamilton Mountain transporting. It would not be easy to find language which would justly describe the scenery of the St. Francis, the Richelieu, Lake Memphramagog, the Yamaska, the Hills of Dunham, with many other portions of Lower Canada. Let a man of taste pass over the country, and his eye and his heart will drink in delight everywhere. Who that has only once seen

our forests in autumn will lose the recollection of them? But I must forbear. Canada is, and I have seen the greater part of it, emphatically a beautiful country.

Buckingham thus speaks of a sunset witnessed by him on the St. Lawrence (5th September, 1840) between Quebec and Montreal :—"The sunset upon the river was one of the richest and most beautiful that we had for a long time witnessed, and would be thought an exaggeration if faithfully depicted on canvass. I remember nothing in the Mediterranean or the Indian Ocean equal to it; and only one sunset superior, which was that seen amid the forests of Tennessee, in the autumn of the last year." (162, 163.)

We take a low and unworthy view of it if we regard the beauty which the God of Nature has scattered so profusely around us, merely as a source of enjoyment; though it be that—and a source of it, too, in perfect harmony with our rational nature—it is an important means of moral, not to say spiritual improvement, when used aright. Be it ours, then, while drinking in the joy which it inspires, to realize the higher benefits of which it is designed as the vehicle.

PART SECOND.

ECONOMIC.

By last Census, taken in the beginning of 1852, the population of United Canada was shown to be 1,842,265,—to which number it had risen from 50 persons in 1622—14 years after the establishment of Champlain's colony at Quebec, and 87 after the discovery of the country by Cartier. The following Table, copied (with a single correcction, and an addition from Mr. MeGregor,) from the *American Statistical Annual* for 1854 (p. 476), exhibits the rate of increase from 1676, as presented by what are recognised as the best authorities :

Lower Canada.				Upper Canada.			
1676,	8,415	1825,	423,650	1770, about	200	1834,	320,693
1688,	11,249	1827,	471,876	1791, less than	50,000	1836,	372,502
1700,	15,000	1831,	511,922			1839,	407,565
1706,	20,000	1844,	690,782	1811,	77,000	1841,	465,357
1714,	26,904	1847,	714,382	1824,	151,097	1842,	486,055
1750,	65,000	1848,	768,334	1825,	158,027	1848,	723,292
1784,	113,000	1851,	890,261	1830,	210,437	1851,	952,004
1800, United Canada, 230,000 —(McGregor.)				1832,	261,060		

It would thus appear that Canada nearly doubled her population in the twenty-four years between 1676 and 1700; that on the expiry of the next fifty years her population was four

and one-third times what it had been at their commencement; and that in 1851 it was three and one-sixth times its amount in 1825—twenty-six years before—and something more than twenty-eight times its number in 1750—101 years previous.

The inhabitants of Canada at the time of the conquest in 1759, exclusive of the native Indians, were entirely French, and are estimated by Mr. McCulloch, in his Gazetteer, as amounting to about 70,000. By 1831, their descendants numbered upwards of 400,000—an increase which he pronounces as probably the most rapid of any on record from births alone.

"The Province of Quebec contained." says Seaman, in his "Progress of Nations," (New York, 1853—p. 595,) "in 1783, by enumeration, 113,000 inhabitants, French and English, exclusive of about 10,000 or 12,000 loyalist refugees from the United States, who went to the Province during the war of the American revolution. Call the population in 1783, 125,000; of these probably 110,000 were of French descent, and but 15,000 of English, Scotch, and Irish descent. According to this calculation, the French population increased the first ten years after the conquest, twenty per cent., to 84,000; twenty per cent. the next ten years, to 101,000; and and at the same rate the last four years to 110,000, in the year 1783. The French population of Canada must have increased nearly twenty per cent. in seven years, amounting in 1790 to 130,000, and at the rate of thirty per cent. each ten years from that time up to the year 1840; amounting in 1800 to 169,000; in 1810 to 220,000; in 1820 to 286,000; in 1830 to 370,000; in 1840 to 481,000; and in in 1844 to 534,000, of whom 518,000, 565 were in Lower Canada. These astonishing results were produced by early marriages, and plain, frugal habits." According to the census returns of 1851, the French population of Lower Canada amounted to 669,528.

In France the increase between the years 1801 and 1851 was a trifle over twenty-six per cent.; the advance made during that time in her population being from 27,349,000 to 35,781,628. Between 1801 and 1851 the population of Great

Britain and Ireland, with the Channel Islands, rose from 16,002,646 to 29,238,209, the increase being thus about 86 per cent.

Between 1790 and 1850 the growth of the free population of the United States was as follows:

1790.....	3,929,872	1830.....	12,866,920
1800.....	5,305,952	1840.....	17,063,353
1810.....	7,239,814	1850.....	19,987,573
1820.....	9,638,131	(*Amer. Alm.*, 1854, p. 200-1.)	

According to Mr. Seaman (p. 583), the white population of what are now the United States was, in 1700,288,000; in 1750, 1,100,000; in 1775, 2,140,000.

Let us select for comparison from these returns respectively the years 1700, 1750, 1800, and 1850, making allowance in the calculations for the fact that it was in 1851, instead of 1850, the Canadian census was taken. The result will stand as follows:—The United States contained in 1850 a population 70 times that of 1700—Canada about 122 times; the United States, 18¾ times that of 1750—Canada, 28 times; the United States, about 4 times that of 1800—Canada, 8 times.

It will be observed that a considerable difference exists between the rate of growth in Upper and Lower Canada—the former having, between 1825 and 1851, made nearly three times the progress of the latter in population. This difference is unquestionably attributable in part to the fact that the mass of the emigration passes, with us, as in the United States, towards the West. There are, however, portions of Lower Canada which are growing with a rapidity much beyond the average—as, for example, "the County of Megantic, which in seven years, from 1844 to 1851, increased from 6,449 to 13,835, or at the rate of 115·40 per cent.; the County of Ottawa, which in the same time has increased from 12,234 to 22,903, or 84·42 per cent.; the County of Drummond from 9,354 to 16,562, or 77·28 per cent.; and the County of Sher-

brooke from 13,485 to 20,014, 49·47 per cent." (First Report on Census of 1851–2, p. 13.)

The progress of Upper Canada has, as a matter of fact, been much more rapid during the earlier period of her history than has been generally believed. In the table given above her inhabitants are set down in the year 1791—that of the division of the former Province of Quebec into the Provinces of Upper and Lower Canada—as being "less than 50,000." Indefinite enough this surely is. There is reason to believe that they did not then exceed 10,000, or at the very utmost 12,000. Mr. Lymburner in his address before the British Parliament against the Quebec Bill, states the English population of Canada to amount to only about three hundred and sixty families (Christie); while Mr. Pitt defended (May 12th, 1791) the proposal of the ministry in regard to the number of members which should constitute the House of Assembly for Upper Canada, by saying that "as there were not above 10,000 individuals in Upper Canada (including men, women, and children), he thought sixteen, in the present state of the Province, was about a reasonable proportion of those who were fit persons to be chosen members of the House of Assembly, and could spare enough time for due attendance." The blank was, therefore, filled up with the word "sixteen." (See Gourlay, Vol. II., p. 103.) The number set down by Mr. McGregor for the year 1800, nine years later, is only 10,000. On this point the following statement, published in 1840 by one of the first men in the country, (Sir John Beverly Robinson, Chief Justice of Upper Canada,) will be allowed to have very great weight: "There are people in Upper Canada still living, who saw it when it contained not a cultivated farm, nor any white inhabitants, but a few fur-traders and soldiers, and perhaps ten or a dozen French families on the south side of the Detroit River. I can myself remember when its population was estimated at less than 30,000; in 1812 it was supposed to be about 70,000; in 1822, 130,000; and in 1837, the census showed a population of 396,000; but all the townships were not then returned.

The number I suppose to amount now to something between 450,000 and 500,000." (Canada and the Canada Bill, p. 31.)

The rate at which Canada West is growing, and has been for the last twenty or thirty years, equals, if it does not more than equal the growth of the very best of the Western States of the American Union. States just beginning, or having recently begun to be occupied, are unsuitable for comparison because of the rush made to them from all quarters for the purpose of securing lands at the Government prices. Let those whose existence has been of a sufficiently long duration to afford a basis for a judgment be selected, and the truth of our averment will be demonstrated. "It will be seen from the United States' census, that the three States of Ohio, Michigan, and Illinois, contained in 1830, 1,126,851. In 1850 they contained 3,505,000, a little over three hundred and twenty per cent. in twenty years. Canada West contained in 1830, 210,473; in 1849 it contained 791,000, which is over 375 per cent. for the same period of twenty years—so that the increase in these three choice States was 55 per cent. less than that of Canada West during the same time." (Census Report, pp. 11, 12.)

In the case of Upper Canada, as in that of Lower Canada and the United States, there are particular regions which are growing with a special rapidity, for example, the Gore and Wellington Districts, whose increase in the 33 years immediately previous to 1850 was 1,900 per cent; the Western District which, in the same time, increased "over 700 per cent.; the London District, 500 per cent.; the County of Norfolk, 550 per cent.; the County of Niagara, about 380 per cent.; while, in eight years, the County of Oxford has doubled its population. In the far West of Canada, the Counties of Huron, Perth and Bruce, have increased from 5,600 in 1841, to 37,580 in 1851, being upwards of 571 per cent. in ten years, an increase almost beyond comprehension. It appears from Smith's work on Canada, that the Huron District has made more rapid progress since its first settlement in 1827,

than the States of Ohio, Michigan, and Illinois did in double that time." (Report on Census, p. 12.) To the growth of our Cities, Towns and Villages we shall advert by-and-bye. Let it suffice to add here, that while 35·37 per cent represents the growth of the United States during the ten years between 1840 and 1850, that of Canada West during the same time was 104·58 per cent. (Report, &c., p. 11.)

"In countries so circumstanced as Canada," says Chief Justice Robinson, "there is a triple source of increase, which, within a moderate space of time, must lead, as it is visibly leading, to astonishing results. First, there is the natural increase of population, under circumstances the most favourable to it; next, the annual influx of emigrants; and, lastly, there is the addition to the wealth of the colony, from the thousands of acres newly redeemed in each year from the wilderness, and the constantly improving circumstances of the whole farming population." (Canada and the Canada Bill, p. 39.)

The number of emigrants who arrived in Canada between the years 1829 and 1846 inclusive, is stated in Scobie's Almanac for 1848 (p. 54) to be 466,179. From 1847 to 1851, inclusive, the arrivals were 229,949 more; so many as 90,150 having entered the country in 1847. The immigration of 1852 was 39,176; and that of 1853, 36,699—with a supposed addition of 5,000 who entered the country by way of the United States—making, therefore, 41,699. (See a very elaborate and interesting article on the Statistics of Canada in the *Canadian Journal* for June, 1854.) In the opinion of the writer of the article referred to, the proportion of this immigration which remained in the country is somewhat about one-half. Suppose this idea to be correct, the number remaining out of the 774,526 arrivals above reported will be 387,263. To these add ten per cent. for natural increase (38,026), the gain from that source will amount in the twenty-five years reported to 425,283.

In an article dated Quebec, Dec. 1854 (given in the Toronto *Colonist* of January 20th, 1855), the number of arrivals by

the River in 1854 is stated to be 53,803—an increase over last year of 17,729.

From the Census Returns for 1852 we collect the following statements in regard to the nationality of our population, their religious opinions, and certain other particulars of a general nature.

With respect to coloured people and Indians the Returns are defective, both classes being in many cases included among the general population. Of the former there can hardly be under from 20,000 to 25,000, (a friend having the best opportunity for judging, tells me they are over 30,000,) and the latter number somewhere about 10,000.

The Origins of the population of Canada are as follow—to wit :

	Lower Canada.	Upper Canada.	Total.
England and Wales	11,230	82,699	93,929
Scotland	14,565	75,811	90,376
Ireland	51,499	176,267	227,766
Canada, French origin	669,528	26,417	695,945
Canada, not of French origin	125,580	526,093	651,673
United States	12,482	43,732	56,214
Nova Scotia and Prince Edward Island	474	3,785	4,259
New Brunswick	480	2,634	3,114
Newfoundland	51	79	130
West Indies	47	345	392
East Indies	4	106	110
Germany and Holland	159	9,957	10,116
France and Belgium	359	1,007	1,366
Italy and Greece	28	15	43
Spain and Portugal	18	57	75
Sweden and Norway	12	29	41
Russia, Poland and Prussia	8	188	196
Switzerland	38	209	247
Austria and Hungary	2	11	13
Guernsey	118	24	142
Jersey and other British Islands	293	131	424
Other places	830	1,351	2,181
Born at sea	10	168	178
Birth not known	2,446	889	3,335
Total population	890,261	952,004	1,842,265

The following statement of the Religious Denominations of Canada, is from the Census Returns for 1851–52 :

Denominations.	Lower Canada.	Upper Canada.	Total.
Church of England	45,402	223,190	268,592
Church of Scotland	4,074	57,572	61,589
Church of Rome	746,866	167,695	914,561
Free Presbyterian Church	267	65,807	66,074
Other Presbyterians	29,221	80,799	110,020
Wesleyan Methodists	5,799	96,640	104,439
Episcopal do.	7	43,884	43,891
New Connection do.	3,442	7,547	10,989
Other do.	11,935	59,585	71,520
Baptists	4,493	45,353	49,846
Lutherans	18	12,089	12,107
Congregationalists	3,927	7,747	11,674
Quakers	163	7,460	7,623
Bible Christians	16	5,726	5,741
Christian Church	10	4,093	4,103
Second Adventists	1,369	663	2,032
Protestants	10,475	1,733	12,208
Diciples		2,064	2,064
Jews	348	103	351
Menonists and Tunkers		8,230	8,230
Universalists	3,450	2,684	6,134
Unitarians	349	834	1,183
Mormons	12	247	259
Creed not known	390	6,744	7,134
No creed given	4,521	35,740	42,261
All other creeds not classed	13,834	7,805	21,639
Total population	890,261	952,004	1,842,265

In the above list there are some omissions, ascribable, it is to be presumed, to oversight somewhere. No return is made, for example, of either Free Church Presbyterians or Congregationalists for the city of Montreal, where the former have three and the latter two congregations. Something similar may have occurred elsewhere, or in the case of other bodies. Such differences will exhaust a portion of the 49,395 persons included under the two classes, "Creed not known," "No creed given."

The Tables and statements which follow will throw light on

a number of points of an interesting nature relating to our population.

Canada contained in 1851, as per Census Returns:

	Lower Canada.	Upper Canada.	Total.
Families	141,331	152,336	293,667
Males	449,967	499,067	941,034
Married Males	136,999	147,872	284,871
Single Males	303,799	342,321	646,020
Widowers	8,677	8,742	17,419
Females	440,294	452,937	893,231
Married Females	135,421	143,506	278,927
Single Females	289,494	293,773	583,267
Widows	14,908	15,528	30,436
Under five years of age	28,601	29,586	58,187
Between 5 and 10 do.	115,035	132,726	247,761
" 10 and 15 do.	104,632	119,293	223,925
" 15 and 20 do.	102,566	110,056	212,622
" 20 and 30 do.	148,710	166,672	315,382
" 30 and 40 do.	94,781	103,992	198,773
" 40 and 50 do.	65,735	69,542	125,277
" 50 and 60 do.	43,648	41,617	85,265
" 60 and 70 do.	24,095	20,356	44,451
" 70 and 80 do.	11,084	7,246	18,330
" 80 and 90 do.	2,959	1,746	4,705
" 90 and 100 do.	407	257	664
Over 100 years of age	38	20	58
Deaf and Dumb	865	478	1,343
Blind	554	316	870
Insane	1,733	1,069	2,802
Births in 1851	36,739	32,681	69,420
Deaths	11,674	7,775	19,429

From the preceding Table it will be seen, that while Upper Canada contains a larger number of persons of the respective ages between 5 and 40 years; from 40 upwards the scale is in favour of Lower Canada, which has 11,084 between 70 and 80 years of age against 7,246; 2,959 between 80 and 90, against 1,764; 407 between 90 and 100, against 257; with 38 persons over a hundred years of age, against 20. The first of these facts may be easily accounted for, from the larger immigration to Upper than to Lower Canada. From the second it would

seem as if there were a tendency to longer life on the part of Lower than of Upper Canadians. At the same time the deaths returned for Lower Canada in 1851 stand, as compared with those for Upper Canada, 11,674 over against 7,755. From the extraordinary length which this return, understood as an averge, would give to life in Upper Canada, it is manifest either that there has been considerable deficiency in the returns, or that from some cause or other the year 1851 brought fewer deaths with it than usual.

According to the Census there were in Lower Canada in 1851, seven married females under fifteen years of age, with 893 married males under 20; and in Upper Canada twelve married females under fifteen, with 574 married males under twenty. In Upper Canada the married females under twenty years of age number 5,994, in Lower Canada 5,415.

Of the following Classes the Census Tables report :

	Lower Canada.	Upper Canada.	Total.
Farmers	78,264	86,224	164,488
Labourers	63,365	78,584	141,949
Male Servants	5,559	3,180	8,739
Female Servants	10,812	12,274	23,086
Physicians and Surgeons	410	382	792
Barristers and Attornies	273	202	475
Clergymen	620	963	1,583
Private Means	3,870	1,116	4,986

The population to a square mile is, in Lower Canada 4; in Upper Canada, 29; in Canada, taken as a whole, 7 59-100.

From the numbers and constituents of our population, with the particulars of a general nature just given, let us now direct our attention to their action and its results.

In reference to these we begin by remarking that the people of Canada have—

1. Brought under cultivation a large portion of a country which they found in a state of Nature; and are raising annually a large amount of Agricultural products.

From the follwing Table an idea will be obtained of what has been done up to the close of 1851 in the first of these respects :

Specifications.	Lower Canada.	Upper Canada.	Total.
Area in acres.....	134,393,600	20,794,825	155,188,425
No. of Persons holding...	95,823	99,860	195,683
No. holding 10 acres and under.....	14,477	9,976	24,453
Do. from 10 to 20 acres	2,702	1,889	4,591
" 20 to 50 acres	17,521	18,467	55,988
" 50 to 100 acres	37,863	48,027	85,890
" 100 to 200 acres	18,639	18,421	37,060
" Over 200 acres	4,591	3,080	7,671
Number of acres held.....	8,113,379	9,826,417	17,339,796
Acres under cultivation...	3,605,076	3,695,763	7,300,839
" Crops.....	2,071,349	2,274,746	4,346,095
" Pasture	1,503,600	1,365,556	2,869,156
" Gardens & Orchards	30,127	55,461	85,588
" Wild.....	4,508,303	6,130,654	10,638,957
Assessed value.....	£29,208,158	£36,670,890	£65,879,048

[Abstract of Census.]

Of the 18 millions nearly of acres taken possession of, there is thus considerably over seven and-a-quarter millions under cultivation, more than seven-eighteenths of the whole. Divided among our population it gives four acres, or thereabout, for each inhabitant. According to the Census Report (24), five acres and one perch is the proportion of cultivated land per individual in the United States.

The average number of acres held by each occupant is, in Upper Canada, 98a. 1r. 1p.; in Lower Canada, 84a. 2r. 27p.: in Canada as a whole, 92 acres. In Upper Canada the averag, value of each occupier's holding is £367; in Lower Canadae £304 16s. 3d. : in the whole of Canada, £332. There are of

occupied acres per inhabitant 10a. 1r. 1p. in Upper Canada; in Lower Canada, 9a. 0r. 17p.: in all Canada, 9a. 3r. 4p. Of lands occupied the proportion which is uncultivated is, in Upper Canada, 6a. 1r. 30p. each inhabitant; in Lower Canada, 5a. 0r. 9p.: in all Canada, 5a. 3r. 4p.—considerably more, that is, than one-half. (Census Report, p. 24.)

The number of cultivated acres was, in—

1831,	2,065,913	in Lower Canada;	818,432	in Upper.
1844,	2,802,317	" "	2,166,101	"
1851,	3,605,076	" "	3,695,763	"

Lower Canada has thus advanced in twenty years from 2,066,913 cultivated acres to 3,605,076; and Upper Canada, from 818,432 to 3,695,763. The latter has therefore at the close of this comparatively brief period over four and-a-half times the quantity of cultivated land which it possessed at its commencement.

In the London, Western, Brock, and Home Districts, the advance made has been as follows. There were of cultivated acres in—

	Western.	London.	Brock.
1842—	69,345	112,633	66,397
1844—	82,726	130,339	83,046
1848—	115,708	177,752	
1851—	144,803	247,106	135,232

The cultivated acres in the Home District were—In 1801, 4,281; in 1811, 14,578; in 1821, 39,732; in 1831, 101,290; in 1841, 253,708; in 1851, 482,839.

For the sake of convenience we have retained the old names; but to prevent mistake, it may be mentioned that what was formerly the Western District constitutes now the Counties of Essex, Kent, and Lambton; that the present Counties of Middlesex and Elgin, represent the old London District; that what was the District of Brock, is now the County of Oxford; while what was the Home District forms the present Counties of York, Ontario, and Peel.

More attention decidedly is being paid than heretofore to the manner in which farming operations are being conducted, and very great improvement is being made. This remark applies hardly less to Lower than to Upper Canada.

Though, as we have seen, the number of owners of land is large and the portion owned considerable, there is yet, and will long be, plenty of it to be obtained over the greater part of the country, if not the whole; and at prices which are reasonable, varying with position and circumstances. The Eastern Townships and other portions of Lower Canada would accommodate hundreds of thousands, if not millions. On the Ottawa a nation might find room. So it is in Western Canada. In the newer Townships Crown Lands are still to be had, and the Canada Company has lands over a great portion of the country. Ere long, I am informed, it is likely to bring 300,000 acres in the Huron District—one of our finest regions—into the market. The emigrant will without difficulty obtain information in regard to all these matters—prices, as well as locality—by application on his arrival to the Emigrant Agents at Quebec, Montreal, or Toronto.

[The following particulars we are happy to have the opportunity of adding from an excellent Pamphlet, recently issued by Frederick Widder, Esq., Commissioner of the Canada Company, entitled "INFORMATION FOR INTENDING EMIGRANTS OF ALL CLASSES, TO UPPER CANADA."]

"The price of Wild Land varies according to locality, from 10s. per acre to £10. In a few remote districts it may still be had at the former rate, but it gradually increases according to density of settlements and facility of communications to the latter rate. In the oldest and most densely settled Townships, Wood Land is more valuable than Cleared Land, as the farmer is dependent on Wood for fuel and other domestic purposes.

"Cleared Farms in the best and oldest settled Townships, with good buildings, are worth from £10 to £15 per acre."

The price of the Company's Lands ranged in 1854 in the Counties of Peterborough, Hastings, Addington, Frontenac, Leeds, Grenville, Dundas, Stormont, Glengarry, Prescott, Russell, and Carleton, from 10s. to 25s. per acre ; from 20s. to 30s. in Ontario, Durham, Northumberland and Victoria ; from 25s. to 50s. and 60s. in Essex and Kent ; from 20s. to 80s. in Perth, and in Lambton to 50s. ; in Huron from 40s. to 80s. ; and in Middlesex from 50s. to 100s.

"In the Eastern section of Upper Canada, the larger portion of Crown Lands are situated in the recently surveyed Townships of Wilberforce, Brougham, and Grattan, on the Bonnechere River, and between them and the Ottawa River, in the Townships of Pembroke, Ross, Westmeath, Horton and McNab ; also in Palmerston, Lavant and Darling ; in each of these the quantity of ungranted Crown Lands is still considerable. In the rear of the Counties of Hastings, Frontenac, and Lennox and Addington, the Townships of Elziver, Kenebec, Kaladar, Olden and Oso, present large quantities of ungranted land, and, although not of superior quality, their low prices ought to induce their sale and settlement. Bedford and and Sheffield, School Townships in the same quarter, offer also considerable quantities of disposable land. In the rear of the Counties of Northumberland and Durham, there are considerable quantities of disposable lands in the Townships of Burleigh, Methuen, Belmont, Harvey, Fenelon, Sommerville, and Bexly. Their quality has not, however, generally been considered such as to have attracted any considerable number of settlers to them, but they are placed with the low priced lands.

The lands in the Counties of Grey, Brant, Wellington, Bruce, and Perth, are filling up rapidly, and it may, therefore, be concluded, that before the termination of the present year, 1855, the Government will scarcely have any lands of a desirable description in that section of the Province for sale, if not already disposed of by the local agencies. The Indian department is, however, about to survey a portion of the large penin-

sula north of the Saugeen, which comprehends about half a million of acres—and these may be considered among the most desirable, still available lands in Upper Canada. The ordinary price of Crown lands in townships east of the County of Simcoe, is 4s. per acre, payable in five instalments; west of Northumberland and Durham, 7s. 6d. per acre, payable by ten instalments, with, in all cases, interest. The School lands, 10s. per acre, with twenty-five per cent. set apart for roads, and same terms as the last named Crown lands. The clergy lands vary according to valuation set upon them. Compulsory occupation and improvement of lands purchased is limited to townships surveyed since the Union of the Provinces."

The Canada Company offers its lands to settlers by way of Lease for Ten Years, or for Sale,—Cash down.

The rents, payable 1st February, are about the interest at six per cent. upon the cash price of the land. When leased, according to locality, two or three years' rent must be paid in advance, but these payments will free the settler from further calls until the third or fourth year of his terms of lease. The settler has the privilege of purchasing the fee simple of the land held under lease, and, of course, stopping payment of further rents, before the expiration of the term, upon paying the purchase money specified in that instalment. A discount is made for anticipated payment. (Pp. 18, 19, 23.)

Let us look now at what is being done in regard to the second of the points above-named, the raising, to wit, of agricultural products.

To aid in forming a correct judgment as to the measure of progress being made in this respect, we present a tabular statement of returns of staple Products in Upper and Lower Canada respectively. We would have preferred the years being the same throughout, but for this no reliable data are within reach :

Produce in Bushels	Lower Canada.			Upper Canada.		
	1831.	1844.	1851.	1842.	1848.	1851.
Wheat	3,404,756	942,835	3,045,600	3,221,991	7,558,773	12 674,503
Peas	948,758	1,219,420	1,473,628	1,193,551	1,753,846	2,872,413
Oats	3,142,274	7,238,753		4,788,167	7,055,730	11,186,161
Barley	394,795	1,195,456	456,344	1,031,355	515,727	625,355
Rye	234,529	333,446	345,290	292,970	446,293	479,623
Indian Corn	339,633	141,008	419,017	691,359	1,137,555	1,662,524
Potatoes	7,357,416	9,918,869	4,533,461	8.080,397	4,751,331	5,077,315
Buck Wheat	106,050	374,809	588,280			679,754

In the quantity of wheat produced it will be observed Lower Canada shows a very great deficiency in 1848 as compared with 1831. This, however, which is attributed in large measure to the ravages of the weevil, is very nearly made up in 1851. Upper Canada exhibits in 1848 a similar falling off, as compared with 1842, in the article of potatoes, which is due chiefly, if not altogether, to the prevalence of the Potato Disease. The advance in the production of wheat in Upper Canada is very great, the quantity coming very little short of quadrupling itself in 9 years. The following are the Counties in Upper Canada yielding in 1851 the largest amount of wheat, peas, and Indian corn:

	Wheat, per acre average.		Peas, per acre average.		Indian Corn, per acre average.	
	Bushels.	lbs.	Bushels.	lbs.	Bushels.	lbs.
Bruce	20	2				
Brant	19	2	17	17	26	31
Halton	18	53	14	23	30	18
York	18	39	18	52	22	15
Oxford	18	30	18	7	16	14
Kent	18	13	17	12	26	38
Peel	18	3	14	45	29	54
Ontario	17	55	18	27	25	46
Haldimand	17	9	12	48	23	19
Elgin	17	6	17	2	26	37
Durham	16	30	17	1	22	58
Waterloo	16	18	16	20	25	42
Peterborough	16	15	16	9	25	27
Simcoe	16	9	17	2	25	7

[Census Report, p. 29.]

The Townships giving the largest returns of wheat in Upper Canada for 1851 are :

	Townships.	Counties.	Bushels.	lbs.
1	Esquesing.	Halton	26	35
2	Scarborough	York	24	3
3	Blenheim	Oxford	21	51
4	Oxford, West	Oxford	21	35
5	York	York	21	5
6	Oxford, East	Oxford	21	2
7	Onondago	Brant	20	40
8	Darlington	Durham	20	32
9	Dover	Kent	20	23
10	Louth	Lincoln	20	17
11	Kincardine	Bruce	20	17
12	Gore of Toronto	Peel	20	15
13	Blandford	Oxford	20	12
14	Pickering	Ontario	20	11
15	Harwich	Kent	20	3
16	Bruce	Bruce	20	...
17	Brant	" "	20	...
18	Greenock	" "	20	...
19	Chatham	Kent	19	48
20	Toronto	Peel	19	45
21	Whitby	Ontario	19	40
22	Etobicoke	York	19	40
23	Dorchester	Middlesex	19	37
24	Tecumseth	Simcoe	19	36
25	Collingwood	Grey	19	25
26	Georgina	Ontario	19	13
27	Westminster	Middlesex	19	10
28	Southwold	Elgin	19	10
29	Scugog	Ontario	19	...
30	Dumfries, South	Brant	18	56
31	Markham	York	18	43

The Counties in the Lower Province giving the largest return of Wheat, Peas, and Oats for 1851, are :

	WHEAT.		PEAS.		OATS.	
	Bushels.	lbs.	Bushels.	lbs.	Bushels.	lbs.
Megantic	15	29	18	40	27	19
Quebec	14	11	22	...	22	10
Bonaventure	14	2	6	24	27	18
Champlain	13	7	17	40	24	10
Stanstead	12	56	12	41	29	10
Missisquoi	12	55	12	...	35	21
Ottawa	12	46	12	16	19	...
Beauharnois	12	41	13	11	26	7
Drummond	12	30	11	16	25	1
Two Mountains	12	10	5	2	19	32
Nicolet	12	10	8	33	21	30
Vaudreuel	11	48	14	47	22	33
Leinster	11	43	10	38	21	6
Sherbrooke	11	35	12	49	26	3
Montmorency	10	56	13	30	12	10
St. Maurice	10	46	9	58	22	20
Yamaska	10	38	8	10	19	9
Verchères	10	28	16	27	20	20
Portneuf	10	21	8	23	19	3
Terrebonne	10	14	11	45	27	...
Dorchester	9	45	9	22	19	...

Megantic is thus the best for wheat; Quebec for peas; Missisquoi for oats. Dorchester produces the largest qusntity of hay; then Stanstead and Huntingdon. (Rp. on Cen. p. 29, 30.)

Below we present a comparative statement of the quantities of staple agricultural products for the United States and Western Canada, for two distinct years each. In the first column the years compared are 1840 for the United States, and 1842 for Canada. The comparison exhibited in the second is for the same year in both cases, viz., 1847:—

	UNITED STATES.		CANADA WEST.		UNITED STATES.		CANADA WEST.	
	Bushels.	Bushels per Ind.	Bushels.	Bushels per Ind.	Bushels.	Bushels per Ind.	Bushels.	Bush. els per Ind.
Wheat	84,823,272	4·96	3,221,991	6·62	111,245,500	5·50	7,558,000	10·45
Barley	4,161,504	·25	1,031,335	2·12	5,649,950	·28	515,727	0·71
Oats	123,071,341	7·21	4,788,167	9·85	167,867,000	8·09	7,055,730	9·75
Rye	18,645,567	1·09	292,970	0·60	29,222,700	1·42	446,293	0·62
Buckwhet.	7,291,703	0·43	352,786	0·72	11,673,508	·56	432,573	0·60
Maize	377,531,875	22·12	691,359	1·42	539,350,000	26·01	1,137,555	1·57
Potatoes	108,295,108	6·35	8,080,397	16·62	100,965,000	4·86	4,751,331	6·57
Pease								

From the above, it will be seen that while the United States greatly surpass Canada in the production of Indian corn, the quantity of wheat produced in Canada is much greater in proportion than that yielded by the States, being nearly twice as much for each individual of the population. (Montgomery Martin, vol 1, p. 135.)

The following is a comparative statement of the quantity of wheat produced in the United States in 1850, with that of Canada as a whole in 1851; and of Ohio in 1850, and Upper Canada in 1851—derived from Amer. Statist. Ann. and Report on Census :—

UNITED STATES.		CANADA.		OHIO.		CANADA WEST.	
Bushels.	Bushels per Ind.	Bushels.	Bushels per Ind.	Bushels.	Bushels per Ind.	Bushels.	Bushels per Ind.
100.503,899	4 19-60	16,155,946	8 56-60	14,487,351	7 19-60	12,675,603	13 19-60

"In the United States, the growth of wheat has increased about 58 per cent. during the last ten years, whilst in all Canada, during the same period, it has increased upwards of 400 per cent!! And taking the article of Indian corn, which is the production that compares most favourably for the United States, the increase on it for the ten years between 1840 and 1850, has been equal to 56 per cent., viz., from 377⅓ millions of bushels to 592⅔ millions—[see page 60 of Mr. Kennedy's Report]—whilst the increase in Canada for the last nine years has been 163 per cent., the census having been taken in 1842 and not in 1841. During the same period, also, the increase in the growth of oats in the United States has been 17 per cent., whilst in Upper Canada it has been 133 per cent.,—in Lower Canada 41 per cent.,—and in both united 70 per cent.

"In pease we find the increase in Upper Canada has been 140 per cent. in nine years; that of the United States, or any of them, is not given in the Abstract of the Census; but, with them, it appears to be an article of little importance; the whole

crop of all the States and territories being only a few bushels over the produce of Canada.

"Though the number of cultivated acres in Ohio is one-fourth greater than those of Canada, being 9,800,000 to 7,300,000, or rather more than ten to seven; yet the bushels of wheat are one-twelfth less, being in Ohio 14,487,000 to 16,202,272.

"Ohio, in cultivated acres, possesses 1-12th of all the United States. In uncultivated acres she possesses 1-22d of the same.

"She possesses 1-4th more cultivated land per inhabitant than Canada, having five acres to four.

"All Canada produces 1-7th more bushels of wheat than Ohio, and 1½ bushels more per individual. Upper Canada, however, produces six bushels more wheat per individual than Ohio—the latter producing in her staple, Indian corn, 29 times more than Canada, which produces 77 times more peas, and 54 per cent. more oats than Ohio. The land at Ohio is valued at nearly double that of the average of the Union—(see the Report of Mr. Kennedy, page 49)—and has more than three times as many inhabitants to the square mile as the average of the Union—she having 49 55-100ths, and the average of the States being 15 75-100ths.

"The produce of wheat per acre in Upper Canada is 16 14-60ths, and in Lower Canada 7 8-60ths bushels per acre.

"In the article of wheat we find that the whole United States produced, in 1850, only 100,479,000 bushels, whilst the one State of Ohio—one out of thirty-two, and four large territories—produced more than one-seventh of the whole Union.

"Again, Ohio produced 7⅓ bushels for each inhabitant, whilst the whole of the United States produced only 4⅓—the former having ⅓ of her cultivated land under wheat, whilst the whole Union has not 1-20th of the cultivated land under that crop." (Report on Census, pp. 31, 32.)

The following extract from the *Leader* newspaper, we copy

from the August number of the *Canadian Journal* for 1853, by way of additional illustration of the point under consideration :—

"CANADIAN EXPORTS OF WHEAT.

Year.	Wheat—bushels.
1838	296,020
1839	249,471
1840	1,739,119
1841	2,313,836
1842	1,678,102
1843	1,193,918
1844	2,350,018
1845	2,597,392
1846	3,312,757
1847	3,883,156
1848	2,248,016
1849	3,645,320
1850	4,547,224
1851	4,275,896
1852	5,496,718

"It appears by the above statement that our exports of wheat in 1852 were about eighteen times as great as they were in 1838. They have doubled four times in fifteen years, or more than once in every four years for the last fifteen years. They are now one-half as much as the exports of wheat from the United States; and at the present ratio of increase—doubling in every four years—*our exports of wheat will, in* 1856, *be equal to those of the United States.*"

ADDITIONAL FARM PRODUCTS FOR 1851.

Derived from Abstracts of Census.

	Lower Canada.	Upper Canada.	TOTAL.
Turnips, bushels	354,249	3,023,378	3,377,627
Clover and Grass Seed	16,763	44,460	61,223
Carrots	100,020	174,895	274,115
Mangel Wurtzel	111,423	54,226	165,649
Beans	23,618	18,109	41,727

ADDITIONAL FARM PRODUCTS FOR 1851.—(*Continued.*)

	Lower Canada.	Upper Canada.	Total.
Hay, tons	727,763	681,782	1,409,545
Hops, lbs	146,438	113,064	259,502
Maple Sugar	5,829,294	3,581,505	9,410,799
Butter	9,809,113	15,976,313	25,785,426
Cheese	737,696	2,226,776	2,964,472
Tobacco	444,819	767,476	1,212,285
Flax and Hemp	1,188,416	56,650	1,145,066
Wool	1,422,874	2,698,764	4,121,638
Fulled Cloth, yards	733,554	546,214	1,279,768
Linen	923,482	14,975	938,457
Flannels & unfulled Cloths	847,273	1,169,279	1,016,542
Beef, barrels	44,161	113,912	158,073
Pork	168,360	310,058	478,418
Fish	79,387	11,884	91,271
Bulls, Oxen, & Steers, nos.	112,127	193,982	306,109
Milch Cows	297,500	296,613	594,113
Calves and Heifers	182,691	254,999	437,690
Horses of all ages	185,343	201,700	386,043
Sheep	649,523	969,222	1,618,745
Pigs	256,587	570,237	826,824

The value of the agricultural products of Canada and the United States (the latter for 1850, and the former for 1851,) is estimated as follows, by Mr. Hutton, in his very excellent Report on the Census (p. 28) :—

	Total. Live Stock.	Total. Grain.	Total. Other Produce.	Total. Manufact-ur'd articles	Total. Beef & Pork	Grand Total.
	£	£	£	£	£	£
Upper Canada...	6,133,354	3,953,777	1,991,885	800,834	946,013	13,825,563
Lower Canada...	4,814,183	1,670,491	2,443,268	655,165	662,795	10,245,902
All Canada.....	10,947,537	5,624,268	4,435,153	1,455,999	1,608,808	24,071,765
Ohio.....	12,793,587	11,134,393	4,788,479	1,794,805	1,859,811	32,371,075
All the U. S....	144,223,120	106,182,070	47,373,546	14,089,383	27,371,439	339,239,558

For the particulars of the above estimate, see Report on Census, pp. 24-28.

Making allowance for home consumption and seed, Mr.

Hutton sets down 15,162,662 bushels as the quantity of wheat raised in Canada in 1851.

"Within the three years, 1849, 1850, and 1851, the amount of butter produced has, in the Upper Province, increased 372 per cent., and that of cheese, during the same period, 233 per cent., which leads to the inference that our milch cows are rapidly improving in quality. The Census returns of the Lower Province, previous to 1851, are very deficient as to the amount of these articles."

While Canada is much behind Ohio in the number of her sheep and the quantity of wool produced, the rate of increase in the number of sheep, as compared with that in the United States, would appear, from page 67 of Mr. Kennedy's Report, to be greatly in her favor, for in ten years the increase in the States has been only 10 per cent.; and in the weight of the fleece only 32 per cent.; whereas, in Canada, the increase in wool has, in nine years, been 64 per cent., and that of sheep 35 per cent., showing an improvement in the weight of the fleece of not far from 30 per cent.

The average weight in Canada is found to be:—

In Upper Canada.....2 14-16ths lbs.
In Lower Canada.....2 4-16ths lbs.
In all Canada.....2 10-16ths lbs.;

whilst in the United States it is, as per page 67 of the Abstract, 2 7-16ths or 2 43-100ths lbs., showing an excess in favor of Canada in the average of nearly 3 oz. per fleece. The proportion, too, in both countries, that is, the whole United States and Canada, is about the same, being about nine sheep to every ten inhabitants. Upper Canada has about ten sheep to every hundred acres occupied; Lower Canada has eight; and the United States has 7 17-100ths.

With regard to horses there are in both Canadas, according to the Census Returns, 385,377, or very nearly one to every five inhabitants, and they have increased during the last nine years 48 per cent. In some Counties the increase has been

very much greater than this, for we find in Oxford an increase of 350 per cent.; this would induce a belief that there was some great error in the returns of 1842, as there seems to be no good reason why the number of horses should not have kept pace with the population; the wealth of the latter having, also, during that time so materially increased. If in nine or ten years the population has increased cent. per cent.; it is almost unaccountable that the number of horses should not have increased in a similar ratio." (Report on Census, pages 34 and 35.)

While Ohio "far exceeds Canada in Indian Corn, Butter and Cheese, Grass seed, Wool, Tobacco, and Beef and Pork," "Canada far exceeds Ohio in Wheat, Peas, Rye, Barley, Oats, Buck-wheat, Hay, Hemp and Flax, Hops, Maple Sugar and Potatoes; and also, considering that Ohio has one-third more cultivated land, in total value of Live Stock. This bears a proportion of only 12¾ to 11, whilst the cultivated land of Ohio to that of Canada is as 10 to 7½.

In all the above enumerated articles, viz: live stock, grain, other farm produce, articles manufactured from Flax, Hemp and Wool, Beef and Pork, Ohio exceeds Canada by £8,199,310, being very little over one-third more than the produce of Canada, and if the produce of the forest be calculated, of which Canada exported in 1851, value far upwards of one million and a half of pounds, the relative wealth per acre would be in favour of Canada."

"When it is considered that there are 31 States, 1 District, and 4 Territories; and that Ohio has 8 per cent of the whole population of the Union,—8¾ per cent. of the grain of the whole Union except Rice,—and about 10½ per cent of all other Agricultural produce, not manufactured, and 7 per cent. of Butter, Cheese, Beef, Pork, and Domestic Manufactures of the whole Union, and that Canada equals Ohio in acreable produce, is there not good reason for expecting that Canada, with her more extended scope, and her more rapidly increasing population, (104, 58-100 per cent in Upper Canada in ten

years, against her 33 33-100 per cent·—with 20 per cent. in Lower Canada, between 1854 and 1851) will in a very few years make a much nearer approximation to the produce of the whole Union than Ohio does now." (Report, &c. p. 36.)

Weigh the facts above-adduced with the points of consideration suggested, and say whether Canada does not in an agricultural aspect, occupy a position honourable and hopeful in a very large degree.

"In Canada,' says Professor Johnston, (Notes on North America, Agricultural, Economical and Social,—Blackwood & Sons, Edinburgh, 1851,—vol. 1st, p. 263), 'every one is satisfied of the paramount importance of the Agricultural interest: a very general desire exists, therefore, to advance it by every reasonable or available means. The superior class of Settlers of whom so many are scattered over Upper Canada, will greatly facilitate the adoption of such means of improvement as are usually employed, or are adopted by Agricultural Societies." By way of corroboration of the favourable views so confidently expressed by the distinguished individual whose words we have just quoted, we beg to call attention to the following facts: viz:—That in 1851 there was granted by Parliament to the Agricultural Societies of Upper and Lower Canada, the sum of £13,794 13s. 3d. (Public Accounts, 1852, p. 82). to aid them in their endeavours to improve the Agriculture of the Country, and £13,811 15s. 4d. in 1853, (Public Accounts, 1853, p. 92); that £500 additional is allowed in aid of a Model Farm in Toronto; that in the University of Toronto a Professorship of Agriculture ably filled, is sustained; and that in the same Institution five Agricultural Scholarships, (value £30 per annum each), have recently been established.

Professor Johnston expresses himself as surprised at the quantity of excellent stock and implements he saw at the Agricultural Exhibition at Kingston, in September, 1850. (Ib. p. 266). "The roots exhibited,' he says, 'turnips, carrots, beet, mangold-wurzel, &c.—were all large and fine, shewing

the aptitude of the climate and soil for this culture," which is as yet but in its infancy. "On the whole," he adds, "this Kingston show was very creditable to the Province of Upper Canada. The thousands of people who came to it, the respectable appearance, the orderly behaviour, the comfortable looks and cheerful faces of both male and female, spoke for a state of things at least not very unflourishing."

The following extracts from Tremenheer's Notes on Public Subjects,—(London, 1852), are in full harmony with the above statements of Professor Johnston.

"Over large tracts of some of the best lands of the Province," says this Gentleman (when speaking of the farming of Upper Canada, which he describes as deficient though improving), "is now to be seen as good farming as one could desire to meet with. Gentlemen of independent property have set the example in many of the most eligible situations for Settlers; substantial farmers from England and Scotland have followed and have introduced with success all the best practices of "the old country." I saw in the neighbourhood of London, Woodstock, Paris, Hamilton, Toronto, admirably managed farms; and whole townships elsewhere—such especially as some north and east of Toronto, and north-west, north-east and south-east of Hamilton—are described as being of similar excellence. Great attention has been paid to the importation of the best Stock from England and Scotland; the markets, therefore, of Toronto, Hamilton, Kingston, &c., are supplied with meat of excellent quality, and well fed. An objection to the growth of root-crops that had been entertained by the small farmers without much capital or enterprise—namely, the difficulty of preventing their freezing in the winter—had been easily overcome by the superior class of farmers, by storing their property in cellars under or near their cattle houses, and I accordingly saw many fields of well cultivated turnips, mangold, and white Belgian carrots, and heavy crops of each. Wool bears a good price (1s. to 1s. 3d. per lb.), and is much sought for by agents

from the manufacturers of New England, as well as by the rising woollen factories of Canada, as at Sherbrooke, in the eastern Townships, and elsewhere. The country is becoming well-settled in all directions, and land within a reasonable distance of a market is worth from 20 to 50 dollars per acre, buildings included. On some farms which I went over, the land was as clean, and whole details of husbandry put out of hand as skillfully as on a good average farm in England." (p. 197–199.)

"At the Agricultural Show,' he adds, 'in Quebec, on the 28th October last, I saw as good turnips, mangold, carrots, parsnips, kohl-rabi, and other roots, as I ever met with at an average Agricultural exhibition in England. If this could be done in the neighbourhood of Quebec, still more could it be on the fine land round Montreal, nearly a degree-and-a-half more to the south. Accordingly at the extremely interesting farm of Major Campbell, (late Secretary to the Governor General), at the Seigniory of St. Hilaire, about 25 miles from Montreal, on the line of the Montreal and Portland Railway, I saw a few days later, excellent root-crops, some stored for the winter, some still in the ground—and an establishment which approaches very nearly, in the completeness of its building arrangements and in the scientific skill with which the whole is managed, to the best specimens of high farming in this Country. (p. 206–207).

In the Agricultural section of the Reports by the Juries of the Great Exhibition in 1851, Canada is mentioned as sending "a fine supply of wheat, of all the ordinary English kinds, but *every* sample of more than ordinary excellence." Mr. Christie's white wheat is commended, and the Polish oats of Mr. Watts, are described as being of "admirable quality," as also the barley exhibited.

"The Canadian Buck-wheat exhibited by Mr. Frenholme is characterised as the finest sample in the Exhibition, being superior to that sent by the United States, Russia, and Belgium. The Hops, Linseed, Arrow-root, Hemlock, Bark, Flax, and Raw

Silk are each specially commended, and some useful suggestions made with reference to their marketable value." (Canadian Journal, Nov. 1852).

Among the prizes bestowed at the New York Exhibiton, there is mentioned one for a very fine sample of White Wheat, produced by J. B. Carpenter, Townsend, Canada West, weighing 66½ lbs. to the bushel; besides which honourable mention is made of a number of other parties by whom Agricultural productions of a superior quality were sent in. (Canadian Journal, March, 1854).

We have to notice next the fact:

2. That in what was so late a wilderness the people of Canada have planted, and are planting every where Cities, Towns and Villages, which reflect credit alike on their energy and taste.

Few persons expect to find, on their arrival in Canada, the number or description of towns which they actually meet with in passing on to their destination, wheresoever that may chance to be. Of Quebec and Montreal they have heard, of course, and Kingston, and Toronto, and Hamilton, and, it may be, of some few places besides. But, with the exception of these, they imagine the country covered with forests, in the midst of which there may present itself, here and there, an insignificant village, which may come, some time or other, to possess some size, and be of some importance.

That such an idea should be entertained is by no means wonderful. Suppose an individual, when he begins to think of coming to the country, to take up, for the sake of informing himself, some one of the books which profess to describe it, it is difficult to derive from it any other notion. The writer, if a stranger, most likely passed through the country with all the speed with which he could manage to get borne along, and hence saw little, and can tell little. In addition to that, having, it may be, entered it by way of Queenston, while his mind was dazzled with the glories of Philadelphia, New York, Bos-

ton, and the other cities south of the line ordinarily visited by tourists, it is a piece of condescension hardly to be looked for, that he should put himself to the trouble of noticing our smaller towns.

Suppose our author, however, a man of a different stamp, a man who can see the small which gives pledge of being larger ere long, as well as the large which was small a short time ago, suppose him qualified in every respect, and as much disposed as qualified to do justice, the reader has been guilty of an oversight which must inevitably mislead him. The book he has taken up was published ten, or a dozen, or, it may be, fifteen, or even twenty years ago; and hence, whatever the ability of the writer, and how accordant soever the view given with the state of things existing at the time to which the description relates, the conception to be derived from it as to what things are now, is necessarily altogether imperfect. Canada is constantly outgrowing the descriptions which are being given of her. The picture which was correct a few years ago thus misleads, if, instead of being regarded as exhibiting what *was*, it is viewed as illustrative of what *is*. And so it will continue to be. Without the gift of prophecy, the production now of a work which shall be true to the facts of even half a dozen years hence, is an impossibility. It is only by frequent revisal, bringing them up every few years to the state of things which has grown up since their first appearance, that the very best works can be made to possess a permanent value as sources of information. Thus it is that the works of Mr. Macgregor and Montgomery Martin make the approximation which they do to the present actual state of the country.

By way of example, we shall present a few statements from the works of Talbot, who published in 1824; of Dr. Howison, the third edition of whose sketches was issned in 1825; and of Buckingham, whose travels in America appeared so late as 1843.

According to Talbot (Vol. 1st, p. 110), who tells us that when Colonel Talbot began his settlement in 1802, "there was not a single Christian habitation within forty miles of his

residence," Toronto was, even after 1818, the most westerly town in Upper Canada; between that city and Amherstburg, a distance of 325 miles, few villages, and these altogether diminutive in size, were to be met with. He recognizes Dundas, Ancaster, and Burford as the only places within that region, bearing, from their populousness, the least resemblance to villages, describing the inhabitants, at the same time, of the whole three as "not exceeding six hundred souls." (Vol. 1, p. 120.)

Dr. Howison, in describing a journey taken by him from the Talbot road to the head of Lake Erie, informs us (p. 199) that his road lay through what then bore the name of the Long Woods, where he met with a stretch of uninterrupted forest thirty-seven miles in length, with only one house within the entire distance.

The regions so lately wilderness are now filled with towns and cities—teeming with population; characterized by great beauty; possessed of large wealth; and enjoying, in not a few cases, the right of sending members to represent them in Parliament. Dundas, one of the three places whose united population made up the number of "six hundred souls," contains at present somewhere about 5000 inhabitants, with seven churches, a handsome town-hall, one or two Bank agencies, if not more, a couple of newspapers, a number of important manufactories—among them a foundry, a paper mill, and two cloth manufactories, besides large flouring mills—and numerous large, substantial, and elegant stores and private houses.

Toronto, our inquirer will learn from the same authority, should he consult him, contains 1335 inhabitants, with about 250 houses, many of which exhibit a very neat appearance. Its public buildings are a Protestant Episcopal Church, which is a plain timber building of tolerable size, with a steeple of the same material; a Roman Catholic chapel, not yet completed, which is of brick, and intended to be very magnificent; a Presbyterian and a Methodist meeting house; the Hospital, which he pronounces the most extensive public building in the Province, describing it, at the same time, as showing a very

respectable external appearance; the Parliament House, and the residence of the Lieutenant General. As for its streets, which are regularly laid out, intersecting each other at right angles, but being in wet weather unhappily, if possible, muddier and dirtier than those of Kingston—only one of them is as yet finished.

Lay down Talbot, and take up Buckingham's "Canada, Nova Scotia, and New Brunswick,"—bearing date London, 1843,—and you will learn (p. 101) that the city of which you have been reading has advanced so far as to have 13,000 inhabitants, with over 200 brick buildings, and nine newspapers, chiefly weekly, some twice, and some thrice a week, but none daily. So soon as you have got over your surprise at this prodigious growth, look into Tremenheere, if you can lay your hand upon it, and he will tell you, on the authority of the last census, that the population of Toronto amounted, in 1851, or rather beginning of 1852, to 30,763. At last you feel that you have got at the truth; the truth you have got certainly as to January or February, 1852; but this is January, 1855. The population now, according to information received by me at the Chamberlain's Office, is somewhere in the neighbourhood of 45,000. In 1851, the estimated value of property, real and personal, was £3,116,400; the assessed value (calculated at six per cent on the estimated) £186,983. 5s. Last year the assessed value amounted to £226,500 real, with £64,450 personal—in all, £290,950; and the estimated to £3,775,000 real, with £1,110,000 personal—making together, £4,885,000.

[The estimated population now (July, 1855) is 50,000. The annual value for the present year is, per Assessors' Rolls, £345,5941 5s.—representing an actual value, real and personal, of £5,793,200.]

The churches in the city number now, including three which are nearly finished, twenty-three or twenty-four—many of them fine specimens of architecture—besides two very handsome cathedrals (one Church of England, and one Roman Catholic);—

irrespective of Yorkville (a handsome suburb), which contains four (the number described by Talbot as in the city when he wrote); one of them, a Methodist one, throwing entirely into the shade even the "intended magnificent" one of which we read in the first of the above descriptions. Besides several magazines—among them Maclear's Anglo-American and the Canadian Journal—somewhere about twenty newspapers (four of them daily) are now published there.

In beauty, Toronto will compare, whether its public or private buildings be looked at, with any city of its size to be found elsewhere. The Provincial Lunatic Asylum, Trinity College, the Normal School, the two Cathedrals, the Banks, the new Mechanics' Institute, and the Ward Schools recently erected, reflect credit on the country. So do the long lines of splendid stores, and the elegant villas which abound on every hand.

Toronto contained, in 1791, two families of Mississauga Indians; 1801, 336 inhabitants; 1817, 1,200; 1826, 1,677; 1830, 2,860; 1832, 4,000; 1842, 15,336; 1845, 19,706; 1850, 25,166; 1852, 30,763; now, in 1855, it is supposed to contain, as already noticed, 50,000..

Instead of an exception, Toronto is but a specimen of what is going on throughout Upper Canada.

Hamilton, which was laid out in 1813, and which in 1836 contained only 2,846 inhabitants, had advanced in 1846 to 6,832; in 1850 to 10,448; in 1852 to 14,199; and cannot be now under 20,000, if it do not go beyond that. It has fourteen or fifteen Churches; several Banks or Bank agencies; a large number of manufactories, including among them several Foundries; a splendid Central School, with other educational establishments corresponding; Merchant Princes, with private residences in harmony with the extent of their business and the beautiful sites occupied by their dwellings; sends a Member (Sir Allan Napier Macnab, the present Premier) to Parliament; and publishes 7 or 8 Newspapers, of which two are daily, besides one or two Magazines.

Brantford, which was surrendered by the Six Nation Indians and surveyed so late as 1830, and whose population in 1834 did not exceed 400, numbered in the beginning of 1852, according to the Census, 3,877. Its present population is somewhere about 5,000. It contains 8 or 9 Churches; has a handsome brick Town Hall and Market House; a Court House; a large and handsome Public School House; Bank Agencies several; and was in 1853 enlightened by four Newspapers. It is the seat besides of a number of important manufactories.

London, surveyed in 1826, contained in 1850, 5,124 inhabitants; in 1852, 7,124. Some time ago it has been proclaimed a city, having acquired a population over 10,000. It has its full share of churches, schools, bank agencies, manufactories, and so forth, and publishes 4 or 5 newspapers.

There are a host of other places in Canada West in relation to which, did the necessary brevity of an Essay admit of it, we might tell a story altogether similar. For example, Niagara, which Howison reports (p. 74) to contain 700 or 800 inhabitants, contained in 1852, 3,340, and has probably now over four thousand; St. Catharines, which he describes as a "village presenting no claim to notice," numbered in 1852, 3,369, and numbers now over 5,000; Galt had risen by 1852 from 1,000, in 1845 to 2,248; Paris from about 300 in 1834 to 1,890 in 1852, now containing between 2,000 and 3,000. Goderich, which in 1832 began to struggle into existence in the midst of an unsurveyed wilderness, at a distance of sixty miles from any settlement, had in 1852, 1,329 inhabitants; Stratford, which in 1840 contained about a dozen houses, has now fifteen hundred inhabitants. Guelph, surveyed in 1827, has now over 2,000 of a population. Instead of the "two or three very small villages" between Kingston and Toronto—the largest of them, Belleville, "containing about 150 inhabitants" —we have now, not to name smaller places, Cobourg with a population of probably not much less than 5,000, having numbered 3,871 in 1852; Belleville with quite as many; Peterborough probably near the same, 3,872 being the number given

by the Census for 1852; Port Hope, which had 2,478 in 1852, with from 3,000 to 4,000 at all events; Bowmanville with from 2,000 to 3,000, Oshawa with 1,142 in 1852.

Passing downwards we find Kingston, which Talbot states, (vol. 1., p. 98,) to contain, when he wrote, 2,336 inhabitants, with 14,725 in 1852; being besides a very handsome city, with as large a number, to say the least of it, of fine buildings, public and private, as any city in the Province in proportion to its size; Brockville—a town worthy of the very beautiful site which it occupies—with not under, we presume, 4,000 inhabitants, the Census reporting it to contain 3,246 in 1852; Prescott with 2,156 in 1852; Cornwall with 1,692 in the same year; and, omitting a number of other places of various sizes, what was Bytown, containing when Bouchette wrote (who published in 1832) nearly a hundred and fifty houses, but which is now the City of Ottawa—with a population over 10,000. Of Chatham we have not spoken, whose population was in 1852, 3,394, or of Woodstock—a very handsome town—which had then 2,112 inhabitants, or of Perth, a fine town, having then a population of 1,916.

Besides the above there are in the Upper Province a multitude of villages, with populations varying from 200 or 300 up to 2,000 or over.

Though differing, of course, among themselves, the Cities, Towns and Villages above named or referred to, are not merely equal, but very much more than equal in appearance to places of the same size in the Old Country. This no intelligent stranger will fail to observe at once. In some other respects they have the advantage of their home compeers. It would be difficult to find one of them without its newspaper. Most of them, so soon as they come to be of any size, have two,—numbers of them more,—as also their Mechanics' Institute.

From Scobie's Almanac for 1854, we extract the following particulars as to the assessed value of a few of them:

Brantford stands there (p. 48–51) at £240,002; Bytown (Ottawa City), £515,650; Amherstburg (with 1,880 inhabi-

tants), £96,682; Goderich, £56,687; Perth, £112,018; Niagara, £132,782; Woodstock, £166,960; Dundas, £200,000; Guelph, £146,000; and Galt, £197,886.

Suppose these sums to represent the estimated value on which the Assessment (6 per cent.) is founded, (which we conceive they must do,) they will be admitted to be still large. The rise which has taken place on property since 1852 would, however, make them now considerably higher.

To Quebec and Montreal we have already adverted. Both are old compared with the Cities of Upper Canada, (with the exception perhaps of Kingston, which occupies the site of Fort Frontenac—erected as a protection against the Iroquois in 1672,) the foundation of the former having been laid by Champlain in 1608, and a commencement made of the latter about thirty years later. While, however, running thus back as to their foundation into our hoar antiquity, thereby securing for themselves the respect which our nature prompts us to pay to the old, and giving us as a people a felt connection which is pleasant with the daring, the toils, and the endurance of the men and women from whom our rich inheritance has come down to us,—they are still as to their growth nearly as modern as every thing else among us except the ground on which we tread, our inland seas and noble rivers, and our primeval forests.

In 1622 the population of Quebec was under 50; by 1720 it had risen to 7,000; it numbered 19,880 in 1816; 20,396 in 1825; 25,916 in 1831; 37,365 in 1850; 42,053 in 1852; and is still steadily progressing, being probably little if at all under 50,000.

The site of Quebec, whether considered in a military, a mercantile, or an æsthetic point of view, is, we presume, unsurpassed the world over. So long as it stands, and we hope its course is but beginning, it will proclaim to the admiring thousands who may gaze on it, the skill, the intelligence and the taste of the man who chose it as the home of his infant Colony. Which is most enchanting,—the view to be obtained from the

Parade Ground of the noble river crowded with ships bearing the flags of all the leading countries of Europe, as well as those of Britain and the neighbouring States, with the large Island of Orleans dividing it and supplying a double channel for it; the St. Charles quietly pouring in its waters for the accommodation of the ship-builders; Point Levi inviting you from the opposite shore to step into one of the steamers which you see starting, that you may please yourself with a ramble through the beautiful country stretching to such a distance behind, above, and below it; or that which bursts on you when looking on it from the Falls of Montmorenci, or the Beauport road as perchance you drive comfortably towards it with a friend,—the sun which is shining on its zinc-covered spires and roofs giving it the appearance of a city composed largely of silver—it is difficult to say.

Of its buildings we can attempt no description, the space to which we are here confined forbidding it, even did we feel ourselves adequate to it. Those who would obtain a good conception of these and of its far-famed fortifications, we would refer to the pages of Buckingham, who presents the most life-like sketches of such of them as were in existence when he wrote, with which it has been our fortune to meet. Suffice it to say that it is a fine, and a beautiful city—worth putting one's-self to some trouble to see.

In 1720 the number of inhabitants in Montreal was 3,000, which rose to 16,000 in 1816; 22,357 in 1825—between which and 1844 it advanced to 44,093. The Census of 1852 reports it as being in that year 57,715. Now, though I cannot speak positively, I presume it to be from 65,000 to 70,000.

As to beauty of site, it is second only to its elder sister Quebec. Perhaps we should rather say that though less imposing, its site is equally beautiful. For mercantile purposes it would not be easy to conceive a position more advantageous. To the eye the mountain, at the foot of which it lies, affords

a "continual feast," while at the same time it supplies the citizens with sites for healthful villas, of which they have largely and wisely availed themselves. Its Public Buildings, including Cathedrals, Churches, Convents, Banks, Exchange, Post-Office, Mechanics' Institute, &c., &c., are numerous. To say that many of them are handsome would be to come very, very far beneath the truth. There are a large number of them which require only space enough to show them to make them be felt imposing. Being constructed of stone, they have a massiveness not seen in the Upper Province, except in the noble Market House at Kingston.

With its Public Buildings the Private Residences of Montreal are in admirable keeping, bearing testimony at once to the wealth and taste of their owners.

The description given by Buckingham of Montreal in 1840 or 1841 is still worth perusal, though from the more rapid change which goes on there, it will leave the reader with a less complete idea of what it is now, than in the case of Quebec.

Quebec and Montreal are the only cities in Lower Canada, though it contains many fine towns of a smaller size—among which may be named Three Rivers, with a population of more than 5,000 at least; Sorel, with a population in 1852, of 3,422; St. Louis with 3,943, and St. John, with 3,215 inhabitants in the same year; Sherbrooke, with 2,998 (now, we believe, much increased); St. Hyacinthe, with 3,313 then,—now probably over 4,000; Laprarie, Lachine, St. Therese, Longueuil, L'Assomption, Montmagny, Alymer, and a number of other places, varying in population from one to two thousand, with villages innumerable containing from two or three hundred to a thousand inhabitants.

It is rather unfortunate that one of the characteristics of Lower Canada, which contributes most to its beauty, and delights as well as interests the traveller through it, should tell against it when its towns come to be looked at in the census. We refer to the continuous lines of neat, comfortable-looking

dwellings, the humblest of them white-washed—extending often for miles—met with everywhere, which are entered, of course, as belonging to the township or parish, while the centres of which they form the extensions figure there as but very moderate sized villages.

Speaking generally, the towns and villages of Lower Canada have a remarkably agreeable appearance, and make a very favourable impression on the mind of the stranger, giving evidence, as they do, of taste in connection with means. Sorel, Three Rivers, and St. Hyacinthe may be named as specimens of the former; Chambly, St. Eustache, and Beauport of the latter. Sherbrooke, in the eastern townships, is one of the handsomest places in the Province. Melbourne, Granby, and Abbotsford, though smaller, are likewise very handsome. We regret our inability to give, as in the case of Upper Canada, specimens of the assessed and estimated value of the towns and cities of Lower Canada, the materials not being within our reach.

Quebec publishes eight newspapers, of which several are daily; Montreal, 27 magazines and newspapers, several of the latter daily. Of the Quebec papers, three are French, and five English: of the Montreal papers and magazines, twenty are English, and seven French. Two French papers are published in Three Rivers, and one in St. Hyacinthe; one English in each of the following places, to wit, St. John's, Aylmer, Sherbrooke, and New Carlisle. Others may be issued elsewhere, but if so, the list whence we have taken these (Supplement to Canadian Directory, 1853) does not name them.

Taken as a whole, the cities and towns of Canada compare favourably, both in regard to appearance and growth, with those of the neighbouring States.

The increase of Boston, for example, between 1830 and 1850 (during which time it progressed from 61,391 inhabitants to 135,000, World's Progress, pp. 444, 701) was 2½ times;

that of New York, a trifle over 2½ times within the same period. Within the same interval the advance of Providence, R.I., was from 16,833 to 41,512 (about 150 per cent.); New Haven, Conn., from 10,578 to 20,345 (say doubling); Hartford, Conn., from 7,074 to 13,555 (nearly doubling); Albany from 24,209 to 50,763 (doubling, with a trifle over); Troy from 11,557 to 28,785 (about 150 per cent.); Philadelphia from 80,464 to 121,376 (somewhat over 50 per cent.); Baltimore from 80,620 to 169,054 (about 110 per cent.); New Orleans from 49,826 to 119,460 (under 150 per cent.) (Amer. Statist. Ann. 1854, p. 143.)

Montreal all but doubled in the 19 years between 1825 and 1844—its rise being, as we have seen, from 22,357 to 44,093. In 1852 it was over 3½ times what it had been in 1816—36 years before—Quebec being nearly three times, and having more than doubled between 1825 and 1852.

Here surely there is nothing either to affront or discourage us.

Let us look now at a few of the newer cities on the two sides of the line, and see how the comparison stands.

Between 1830 and 1850, Oswego rose in the number of its population from 2,703 to 12,405; Buffalo from 8,668 to 42,261; Rochester from 9,207 to 36,403; Cincinnati from 24,831 to 115,590; St. Louis from 4,977 to 77,860; and Detroit from 2,222 to 21,019. (Amer. Stat. Ann., 1854, p. 143.) Thus within these twenty years the advance of the cities above-named in population stands respectively:—

Oswego, nearly 5 times; Buffalo, near 5 times; Rochester, close upon 3 times; Cincinnati, nearly 4¾ times; Detroit, 9½ times; and St. Louis, nigh 16 times.

Within the twenty years intervening between 1834 and 1854, the increase of Brantford was 10 times (that is, brought it up to ten times what it was in 1834); of Hamilton, in the 18 years between 1834 and 1852, 7 times; of Toronto, between 1832 and 1852, nearly 7¾ times; of Ottawa City, late

Bytown, between 1830 and 1855, 25 years, 10 times; of St. Catherines, between 1832 and 1852, 5 times!

With the single exception, then, of St. Louis, the Canadian cities just-named have been growing more rapidly than those —the elitè of our neighbours—with which we have compared them. But London has, within the last four years, viz., between 1850 and 1854, doubled itself—a rate of growth which, continued for the next sixteen years, would make it outstrip St. Louis, which has doubled four times in twenty years, while London's progress during the last four is at the rate of five doublings within the same period.

In one very important respect St. Louis has unquestionably the advantage,—the continuance of its growth, to wit, being a *fact*, while the exact amount which the future is to do for London, for which we doubt not it will do much, remains, of course, an uncertainty. To St. Louis we, therefore, hold ourselves ready, on this score, to doff our bonnet, hoping that it will have the good manners duly to appreciate the compliment.

3. Canada, young as she is, has made a beginning in manufactures, which affords fair ground to hope that she will, ere long, occupy in this department a high position.

The appearance which she made at the World's Fair was highly creditable to her, a very respectable proportion of her exhibitors either carrying off prizes or having honorable mention made of them. To Mr. Perry of Montreal, for example, a prize was given for a fire-engine, distinguished for its power and beauty; to Messrs. Saurin of Quebec, for sleighs, which were much admired; and to Mr. Paterson of Dundas, for blankets, described as being of very superior quality; besides which, the two latter gentlemen received prizes at New York, Mr. Paterson's blankets being stated to be the best exhibited there.

Of no fewer than four Canadians honorable mention is made in the Reports of the Juries of the Great Exhibition, for the

manufacture of the single article of axes; to wit, Messrs. Ladd, Leavitt, and Shaw, with the firm of Scott and Glasford; as also of Mr. Wallace for staves (Report, pp. 490, 491), and Mr. Stewart for a single sleigh harness.

It is to be regretted that in relation to a point of such importance as the manufactures of the country, the late census returns should be so deficient. Little do those think, who withhold, whether from carelessness or whatever other cause, the information necessary to their completeness, how unwisely, as well as improperly, they are acting. The country that is enriching them they wrong, by making it appear behind what it truly is; and they hold it back, and consequently themselves, by the preventing of efforts to which intelligent and energetic men might be prompted, without at all interfering injuriously with them, through the knowledge of what was done by others.

Deficient, however, as these returns are, they will still give us some insight into the kinds of manufacture which are being carried on.

With this view we will select a few particulars from them.

For Upper Canada we find 610 grist mills reported, of which 41 are impelled by steam, and 569 by water. Two hundred and seventy-eight of them return 1,768,840 barrels of flour as turned out by them per annum; eleven, 5,675 per week; and 23, 3,821 per day. Of 77, the annual dues or rents are given as £11,674. One hundred and sixty-five of them make no returns. The hands returned as employed are 1,588. Four hundred and thirty-nine of them report £608,306 as the amount of their invested capital.

There are reported as in operation in Upper Canada 1,618 saw-mills—169 of them wrought by steam, with 1,449 by water. The quantity of timber returned by 966 of them is 374,953,000 feet per annum; 151 return 510,000 feet per day; 20, 11,545 logs—plank 472 M. Of annual profit or rent 139 return £34,655. Capital to the amount of £419,868

is returned as invested in 1169. The number of men returned as employed by them is 4,884. Four hundred and thirty-three make no returns.

One soap and candle factory makes 90 tons of soap per annum, with 160,000 cwt. of candles; and employs 25 men. One woollen factory in Carlton produces 35,000 yards of cloth annually; two in Grenville and Leeds, which employ 65 men, 133,000; one in Frontenac, Lennox, and Addington, 100,000, employing 32 men; two in Northumberland and Durhum (one of them employing 170 hands), 300,000; one steam power, 50,000; four, 144,000, with 1,260 pairs of blankets. Two agricultural implement manufacturers return £3,750 capital, employ 30 men, and produce £3,315 per annum.

The Niagara dock cost £40,000, and gives employment to between 200 and 300 men.

A single foundry in Grenville and Leeds, returns 60 men as employed, 800 tons of iron as cast per annum, £25,000 as capital invested, and £4,000 per annum of profits.

Two lathe mills turn out 100,000 feet annually; and one paper mill, with £2,000 capital, employs 11 men, and produces 40 tons of paper.

Lower Canada reports 536 grist mills—4 steam, and 532 water; the produce of 101 is returned, as 162,010 barrels of flour per annum. Thirteen produce 684 per day. By 206 produce or rents to the extent of £32,074 are annually realized. Two hundred and sixteen make no returns. The number of hands returned as employed is 836. Three hundred and seventy-five return £300,754 of capital.

Of saw mills there are reported for Lower Canada 1079—7 being impelled by steam, and 1,072 by water. One hundred and fifty-three return 24,523,300 feet of timber per annum; 21, 34,500 feet per day; 25, 55,200 logs—100 per day; 138, 3,632,450 deals or planks. Three hundred and twenty-two report £51,412 as rent or annual profit, and £357,155 as ca-

pital. The number of hands reported as employed is 3,731. From 420 no returns were received.

Two tanneries return £3,500 capital, £5,375 profit, men 14. One lathe and planing mill returns a capital of £15,000, with £25,000 of proceeds, and 25 men. By one scythe and rake factory, 74,000 dozens of scythes and 140,000 dozens of rakes are made annually. One ship-yard at Portneuf employs 150 men. Two paper mills return £1500 capital, £4500 profits, and 101 men as employed. One pail factory, with £600 capital, produces 20,000 pails. Two paper mills, with a capital of £8500, return £12,500 as proceeds, with 22 men.

One Cotton Factory returns £1,750 capital, 40 men, and £6,250 as annual proceeds. One Saleratus Factory, employing 4 men, produces 36,000 lbs. annually.

A Glass Factory in Vaudreuil, returns £11,000 capital, with a produce of 30,000 boxes of 50 feet each, 150 men being employed.

In the City of Quebec 17 Carriage Factories are reported.

For the City of Montreal Brick-yards are reported producing 2,500,000 bricks annually, and furnishing employment for 50 men. One Grist Mill in Montreal, produces 30,000 barrels of flour. One Boot and Shoe Factory returns in 1850, £45,000. One Soap and Candle Factory, produces 5,000 boxes of Candles, with 1,800 boxes of Soap. By one Ship-yard 100 men are employed. Among the returns for Lower Canada are included 70,389 barrels of fish.

These particulars have been presented merely by way of specimen; for the sake of convenience we shall avail ourselves, for the residue of the Reports,—of a Table on this head, derived from the Abstract of the census,—given in the American Statistical Annual for 1854, p. 481.

There were in Canada, according to the Census, in 1852:

Establishments.	U. C.	L. C.	Total.	Establishments.	U. C.	L. C.	Total.
Asheries	93	209	302	Mustard Mills	1	—	1
Axe Factories	10	3	13	Nail Factories	2	3	5
Agricultural Implement Fact.	2	—	2	Oatmeal Mills	42	16	58
Barley Mills	9	1	10	Oil Mills	1	7	8
Broom Factories	3	—	3	Pail Factories	12	6	18
Brick Yards	4	9	13	Plaining Mills	18	7	25
Bark Mills	1	—	1	Pot Asheries	2	8	10
Breweries	86	10	96	Plaster Mills	10	3	13
Cabinet Factories	—	2	2	Paper ditto	8	4	12
Carding Mills	6	—	6	Potteries	9	5	14
Carriage Factories	—	24	24	Powder Mills	1	—	1
Carding & Fulling Mills	50	208	258	Pyroligneous Acid Works	—	1	1
Chair Factories	—	2	2	Pump Factories	3	—	3
Clover Mills	1	—	1	Rail ditto	1	—	1
Cloth Factories	8	2	10	Rope ditto	5	2	7
Comb ditto	3	—	3	Rake ditto	1	1	2
Cooperages	—	3	3	Rifle ditto	1	—	1
Cigar Factories	5	—	5	Saw Mills	1618	1079	2697
Cotton ditto	1	1	2	Shingle Factories	36	4	40
Distilleries	127	7	133	Salaratus ditto	3	1	4
Engine Factories	1	4	5	Stave ditto	5	2	7
Fanning Mills	2	—	2	Scythe & Rake do.	—	1	1
Fanning Mill Fact.	3	—	3	Stone-ware ditto	1	—	1
Forges in St. Maurice	35	Hands.		Sash ditto	4	—	4
Fulling Mills	161	—	161	Soap ditto	5	11	16
Foundries	97	33	130	Starch ditto	1	2	3
Glass Factories	—	1	1	Ship-yards	2	18	20
Grist Mills	610	536	1146	Tanneries	270	218	488
Glue Factories	1	—	1	Threshing Mill Factories	—	3	3
Lath ditto	11	—	11	Turning Lathes	2	—	2
Last ditto	4	1	5	Tobacco Factories	—	7	7
Last & Peg ditto	2	—	2	Vinegar ditto	4	—	4
Lime Kilns	—	2	2	Woollen ditto	90	17	107
Marble Factories	1	—	1	Wheel ditto	1	—	1
Machine shops	4	3	7	Whip ditto	1	—	1
Match Factories	—	2	2	Piano-Forte ditto	—	7	7

The above Table is accompanied by the statement that it probably does not represent one-third the actual existing manufacturing establishments in the Province; but it shows that Canada has progressed rapidly in this branch of Industry, and indicates the descriptions of manufacture carried on.

In these returns, it will be observed, there does not appear for the whole of Upper Canada a single Cabinet, Carriage or Chair manufactory, or a single Cooperage or Lime-kiln—all of which, as every one knows, are to be found over the whole country. In Toronto alone, for example, there is a Cabinet Establishment that for extent of business and character of work will compare, we should suppose, advantageously with any thing of the kind on this Continent; we refer to Jacques & Hay's unfortunately burnt out a few days ago, but already rebuilding. It is to be hoped that by the time next Census comes to be made, returns representing the true state of the Country, and thus assisting it to take the position in the eyes of the world which of right belongs to it, will be supplied.

Deficient, however, as these returns are (and be it remembered it is not on the parties employed in collecting them, but the withholders of information the deficiency is chargeable), a glance at them will show that there are few of the useful occupations in which there is not a commencement made, while in numbers of them gratifying progress is exhibited. There is one item from the entire absence of which the Country would suffer little, we refer to the Distilleries. We hope the capital invested in these may find ere long more beneficial, yet not less profitable employment.

It may be noticed here that Mr. Logan in his Report for 1852–53, (p. 52–54), gives the names of certain parties in Lower Canada, who are said to manufacture among them annually over 18,500,000 bricks, sold chiefly in Montreal and Quebec.

Among other employments which have recently sprung up among us may be named manufactories of Railroad Carriages and Locomotives. Of the latter Mr. Good of Toronto, has already turned out a number that do him credit, These are being made also in Montreal; and Hamilton is producing carriages which will compare favourably with the best seen elsewhere.

Mathematical Instrument making has also made a beginning among us.

Nine Ship-yards in Quebec employ among them 1,338 men. With respect to the Ships built in Canada, Messrs. Tonge & Co. of Liverpool, express themselves thus in their Circular of 1852.—"We have much pleasure in noticing a marked improvement both in the model, material and finish of Canadian Ships, the majority of which have been constructed to class six or seven years, and to which a decided preference is given by buyers over the spruce ships, or those classing but four or five years, even at a very increased price. Among those which have arrived within the last eight months, will be found some as fine specimens of Naval Architecture, as ever have been produced, combining in reality (from having great length of floor and fine ends) both carrying and sailing properties of no ordinary kinds." (*Canadian Journal*, Feb. 1853.)

[An extensive Sugar Manufactory, erected at a large cost by P. Redpath, Esq., is now in successful operation in Montreal.]

Canada has—

4. Established a large, important, and rapidly growing commerce.

A good general idea of the commerce of Canada in the earlier period of her history, which will assist us in appreciating the progress she has since made, may be obtained from the subjoined Table, copied from Macgregor's Commercial Statistics, Vol. V., pp. 254, 255 (London, 1850). The sums mentioned are in sterling money :

Years.	Vessels.	Imports. or Exports.	Where from, and to.	Articles.	Separate amount. £ s. d.	General amount. £ s. d.
	No.					
1754	53	Imports.	France.....	Merchandize.....	157,646 5 0	
			From W. Ind...	Wine, rum, brandy, &c.	59,123 7 0	
						216,769 12 0
	52	Exports.	To France.....	Furs.....	64,750 2 6	
			Ditto.	Oil, Gensing, Capillaire.		
				Timber, &c.....	7,083 6 0	
			Louisbourg, &c	Fish, Oil, Iron, Vegetables, &c.....	3,906 19 2	
						75,360 7 8
				Balance against Colony.	.....	141,249 0 0
1769	34	Exports.	From Quebec.	Furs and Sundries.....	345,000 0 0	
				Oil, Fish, &c., from Labrador.....	10,000 0 0	
						355,000 0 0
		Imports	From England.	Manufactured Goods, & West India Produce...	.....	273,400 0 0
				Balance in favor of Col'y	.....	81,600 0 0
1786	93	Exports.	From Quebec...	Furs, and other Colonial Produce	445,116 0 0	
				Fish, Lumber, &c., from Labrador and Gaspe...	45,000 0 0	
						490,116 0 0
		Imports.	From England.	Manufactured Goods, & West India Produce...	.....	343,263 0 0
				Balance in favor of Col'y	.....	146,853 0 0
1808	334	Exports.	From Quebec...	Furs, and other Colonial Produce	350,000 0 0	
				Wheat, Biscuit & Flour	171,200 0 0	
				Oak and Pine Timber, Staves, Masts, &c.....	157,360 0 0	
				Pot and Pearl Ashes....	290,000 0 0	
				New Ships, 3,750 tons, £10 per ton.....	37,500 0 0	
		Exports.	From Labrador and Gaspe....	Fish, Lumber, Oil, &c...	120,000 0 0	
		Exports.	To U.S. *via* Lake Champlain...	Sundries, about.....	30,000 0 0	
						1,156,060 0 0
		Imports.	From England.	Manufactured Goods £200,000		
				W. I. Produce.. 130,000		
					330,000 0 0	
			From U. States.	Merchandize, Tea, Provision, Tobacco, &c....	100,000 0 0	
				Oak, Pine, Tim., Masts. &c.....	70,000 0 0	
				Pot and Pearl Ashes.....	110,000 0 0	
					280,000 0 0	
						610,000 0 0
				Bal'ce in favor of Colony	.....	546,060 0 0

From the above it will be seen that within fifty-four years—from 1754 to 1808—the number of vessels engaged in the commerce of the country increased from 53 to 334 ; that the Exports advanced from £75,360 7s. 8d. to £1,156,060 ; and the Imports from £216,769 12s. 0d., to £610,000; and that at the close of that period the balance stood £546,060 in her favour, instead of being £141,249 against her.

In the latter of these years, 1808, we further observe that the Trade with the United States consisted of Exports to the value of £30,000; with Imports to the amount of £610,000.

Two ships, laden with wheat,—supposed to be the first grain exported,—arrived at Marseilles from Canada in 1752—two years previous to the commencement of the period of which we have spoken above, (Smith's Canada, Vol. I., 110, Intro.) The extent to which this trade, whose beginning was thus so small, has now grown, was noticed in connection with the subject of Agriculture, where the export of Wheat for the year 1852 was stated to have reached 5,496,718 bushels.

The Imports of Canada from Great Britain amounted in the year 1800 to $2,208,528, or £552,132 ; in 1805 to $2,030,313 —or 507,578 5s. ; in 1810 to $4,701,220—or £1,175,305 ; and in 1815 to $8,221,003—or £2,055,250 15s. currency. Andrews' Colonial Lake Trade, p. 613.)

Between the years 1829 and 1840 inclusive, the value of the Imports into Canada and Exports from it, was—in sterling money :

Year.	Imports.	Exports.	Year.	Imports.	Exports.
	£	£		£	£
1829	1,233,907	1,447,485	1835	1,601,503	1,023,609
1830	1,502,914	1,155,404	1836	2,031,769	1,212,980
1831	1,703,626	1,195,516	1837	1,660,253	1,012,843
1832	1,567,719	952,463	1838	1,534,276	1,091,345
1833	1,665,144	965,026	1739	2,229,927	1,217,554
1834	1,063,643	1,018,922	1840	1,994,917	1,739.055

With considerable variation in the intervening amounts, occasioned by a variety of causes, these twelve years bring the Imports up from £1,233,907 to £1,994,917; and the Exports from £1,447,485 to £1,739,055 sterling : the former having reached the sum of £2,229;927 in 1833. (Macgregor, Com-Stat., Vol. V., p. 270.)

To the above have to be added 9½ per cent., according to to the calculation of the Board of Registration.

In the following Table, derived (with the exception of the Imports for 1848, which are taken from Lord Elgin's Despatch on the state of the Colonies) from the statements and estimates of the Board of Registration and Statistics (Appendix to First Report, p. 79), and from the Canadian Almanac for the years 1852 (p. 58) and 1855 (p. 44)—the total imports (inland included, except, we suppose, 1848) are given from 1841 to 1853 inclusive; with the total exports (that is, including those from inland ports) for 1851, 1852, and 1853 :—

IMPORTS AND EXPORTS FROM 1841 TO 1853—in Currency.

Years.	Imports.			Exports.		
	£	s.	d.	£	s.	d.
1841	2,892,494	1	1	2,427,796	17	10
1842	2,782,017	14	1	1,720,219	3	6
1843	2,568,083	16	11	1,755,850	18	5
1844	4,602,130	10	5	2,241,080	0	5
1845	4,940,739	15	11	2,777,648	8	9
1846	4,780,857	5	5	2,524,795	5	1
1847	4,548,940	6	4	2,680,382	11	10
1848	(2,649,584	17	11)	1,749,167	11	1
1849	3,002,599	0	0	2,327,564	0	0
1850	4,245,517	0	0	2,669,998	0	0
1851	5,358,697	0	0	3,452,651	0	0
1852	5,071,223	0	0	3,826,091	0	0
1853	7,995,359	0	0	5,950,325	0	0

Thus, in 1853, the imports reach the sum of $31,981,436; and the exports $23,801,300—the former amounting to not

more than three times, and the latter to nearly two-and-a-half times what they were only twelve years before. For a country so young as Canada, this will be admitted to be a very large commerce indeed.

Reckoning the population of the United States at ten times that of United Canada (which, when the slaves are left out, comes near enough for purposes of calculation), the amount of her exports should be $238,013,000, to make them, in proportion to numbers, equal those of Canada. But the entire amount of the exports of the Union for 1852 (one year further back than the time above given for Canada) is stated in the American Almanac for 1854 (p. 172) to be $209,658,366—which comes over $28,000,000 short. Only two States in the whole Union surpass us in amount, to wit, Louisiana and New York—the former of which exported to the value of $49,058,885, and the latter $87,484,456 during the same year. Canada exceeded Massachusetts by more than seven millions and a quarter—the exports of that State being, for 1852, $16,546,499.

Putting inports and exports together, the commerce of Canada, irrespective of her internal trade, amounted, in the year 1853, to $55,782,736.

[Our imports, dutiable and free, for 1854, amounted to £10,132,331 6s. 9d.—being an increase on the year preceding of £2,137,927 5s. 8d.; and on 1852 of £5,061,700 2s. 10d. (*Leader*, 7th July, 1855)].

So much for the extent of the commerce of Canada; let us look now for a few moments at its character, the countries with which it is carried on, and the number of vessels and men it employs.

Of its general character an idea may be obtained by the following tables, extracted from Andrews' Report on Colonial and Lake Trade, 1852 (pp. 17, 18):—

IMPORTS INTO CANADA BY RIVER ST. LAWRENCE,
Giving only the Principal Articles and Values for the year 1851.

Articles.	Value.	Articles.	Value.
Tea	$168,084	Sugar	$712,408
Tobacco	18,924	Molasses	60,968
Cotton Manufactures	3,018,332	Salt	25,980
Woollen Manufactures.	2,301,816	Glass	78,260
Hardware Manufacures	1,627,208	Coal	101,176
Wooden Ware	11,612	Furs	90,032
Machinery	6,852	Manufactures of Silk	407,492
Boots and Shoes	6,868	Manufac. India Rubber	233,324
Manufactures of Leather.	53,156	Dye Stuffs	38,916
Hides	1,164	Coffee	13,632
Tanned Leather	46,440	Fruit	54,304
Oil, not Palm	135,708	Fish	71,260
Paper	65,228	Unenumerated	5,885,776
Rice	12,396	Total	$ 15,217,316

The above includes the imports in transit for the United States, and those under bond for Upper Canada.

EXPORTS FROM CANADA TO OTHER COUNTRIES,
(*Principally Great Britain*), *giving the principal Articles and Values, for the year* 1851.

Articles.	Values.	Articles.	Values.
Apples	$2,404	Oars	$4,536
Ashes, Pot	86,900	Oats	2,276
Ashes, Pearl	37,372	Peas and Beans	8,960
Ash Timber	14,900	Pine Timber, red&white	1,974,760
Barley	408	Pork	30,424
Battens	1,960	Shingles	260
Beef	5,268	Spars	44,640
Birch Timber	18,468	Staves	382,136
Biscuit	4,376	Tamarac, wood& sleep's	6,096
Butter	26,596	Furs and Skins	12,208
Deals, Pine and Spruce	937,480		
Elm Timber	196,124	Total from Quebec	$4,671,048
Flour	570,876	Value of similar articles from Montreal	2,060,156
Handspikes	900	Unenumerated from other Ports	1,401,212
Lard	2,256		
Lath-wood & Fire-wood	32,080	Total Exports by the St. Lawrence	$8,132,416
Masts	67,100		
Meal, Corn and Oat	9,976		
Oak Timber	189,308		

The Products of the Forest amounted in 1850 to £1,118,411 15s. 3d.; in 1851 to £1,425,927 18s. 5d.

Of Agricultural Products (including animals and their products, vegetable food, and other Agricultural Products), the value was :

In 1850, £1,000,318 13s. 0d.; in 1851, £964,097 0s. 0d.

There were exported from Canada during the year 1851, in addition to the above :

Products of the Seas, to the value of.....	£51,225	5	6
Products of the Mines.....	17,826	7	5
Manufactures.....	11,327	10	3

(Lord Elgin's Despatch—Returns, Address, &c., 46, 47.)

Notice has been taken when dealing with the Agricultural state of the country, of the very large exports of Wheat. The following Table shows the quantities of White Pine which have been exported between the years 1844 and 1851 :

Years.	Cubic Feet.	Years.	Cubic Feet.
1844	11,950,438	1848	10,709,680
1845	15,828,880	1849	11,621,920
1846	14,392,220	1850	13,040,520
1847	9,626,440	1851	15,941,600

(Andrews, p. 419.)

Ships built at Quebec form another very important article in the commerce of the country. There are in that City "about twenty-five ship-building establishments, and eight or ten floating Docks, capable of receiving largest-class vessels. The class of vessels built range from 500 to 1,500 tons and upwards, and there has been lately established a resident "Lloyd's Surveyor, to inspect and class the ships." (Andrews, p. 421.)

The following Table, which we copy from Lord Elgin's Despatch (Return, &c., p. 50), with the addition of the number for 1853, from the *Canadian Almanac* for 1855 (p. 45), exhibits the extent of this trade :

Years.	Number of Vessels.	Tons.	Years.	Number of Vessels.	Tons.
1843	48	13,785	1849	37	24,396
1844	48	15,045	1850	45	30,387
1845	53	26,147	1851	65	41,505
1846	40	19,764	1852	42	27,856
1847	70	37,176	1853	50	49,541
1848	41	19,909			

The value of these vessels varies from eight pounds to twelve pounds ten shillings per ton. Ten pounds currency per ton is stated to be about the average. Their number during these eleven years was in all, 489; their tonnage, 305,411; and their value, £3,054,110.

There were built in the Province in 1852—53 steam-vessels, with a tonnage of 7,297; and 252 sailing vessels, whose tonnage amounted to 72,533 : in all, 305 vessels, and 79,830 tons. Those built in 1853 "are set down at two steamers and 136 sailing vessels, of an aggregate tonnage of of 59,070." (*Amer. Statis. Annual*, 1854, and *Can. Alm.*, 1855, p. 45.)

From the Tables given above of Imports and Exports by the St. Lawrence an idea may be formed of the character and extent of the trade with Great Britain, from which the former are chiefly received, as to her the latter are chiefly sent. The one which follows shows the nature and extent of the transactions with the United States.

The trade with British North America and other countries will be noticed afterwards.

Imports into Canada from the United States in the year 1851,—*with Exports from Canada to the United States during the same year :*

Imports.		Exports.	
Articles.	Value.	Articles.	Value.
Tea	$893,216	Ashes	$65,992
Tobacco	403,860	Lumber	766,628
Cotton Mannfactures..	565,124	Shingles	20,732
Woollen do.	446,260	Cattle, of all kinds and sizes	140,176
Hardware do.	318,844	Horses	185,248
Wooden-Ware	53,724	Wool	41,896
Machinery	85,768	Wheat	491,760
Boots and Shoes	42,592	Flour	1,181,484
Leather Manufactures	47,388	Barley and Rye	75,596
Hides	89,204	Beans and Peas	41,588
Leather Tanned	126,232	Oats	135,708
Oil (not Palm)	47,804	Butter	38,004
Paper	32,996	Eggs	38,008
Rice	19,920	Unenumerated	1,705,664
Sugar	278,460		
Molasses	19,296		
Salt	79,816	Total value of Exports to United States	$4,929,084
Glass	18,828		
Wool	38,652		
Furs	44,264		
Silk Manufactures	80,769		
India Rubber do.	55,960		
Dye-stuffs	12,680		
Coffee	116,988		
Fruit	81,144		
Fish	7,544		
Unenumerated	3,922,044		
Total value of dutiable Imports from the U. States in 1851	$7,943,384		

Canadian Produce of various descriptions, to the value of $1,546,534, was received in bond at New York and Boston in 1851, under the "draw-back law," by which duties on articles passing through on their way to or from Britain or other countries were returned. During the same year goods to the value

of $1,138,913 passed "in bond" to Canada from the same cities. "The greater value of the imports is made through Boston; but of the exports through New York. Wheat and flour form the principal articles of bonded export." The value of Canadian wheat and flour received at New York in the years 1849, 1850, and 1851, was $3,876,626—of which $3,378,038 worth was exported. (Andrews, pp. 431–434.) In the Annual Report of the Governor of the Boston Board of Trade, read 17th January, 1855, it is stated that the imports for Canada, through Boston, have increased from $25,000 in 1849, to over $5,000,000 in 1854. (*British Colonist*, Jan. 21st, 1855.)

The "tolls levied by the State of New York on Canadian Produce passing through her Canals towards tide-water, amounted in two years—1850 and 1851—as near as could be ascertained, to over six hundred thousand dollars; and property passing through the same channels from tide-water, for the same period, probably paid half as much more; making about four hundred and fifty thousand dollars annually contributed by the Canadian trade to New York Canals." (Andrews, p. 435.)

The relative proportions of certain classes of articles procured by Canada from Great Britain and the United States, are exhibited in the following statement made by Lord Elgin in his Despatch to the Right Hon. Sir John S. Pakington (Return, &c., p. 45.)

"During the year 1851, there were imported into Canada of Cotton manufactures to the value of—

From Great Britain.....	£609,281	4	7
From the United States.....	192,887	14	1

LEATHER.

From Great Britain.....	11,140	12	4
From the United States.....	32,817	0	8

LINEN.

From Great Britain	84,194	10	7
From the United States.....	9,204	4	5

SILK.

From Great Britain	129,009	9	7
From the United States	29,262	14	7

WOOL.

From Great Britain	486,030	9	3
From the United States	111,898	12	4

MACHINERY.

From Great Britain	1,410	2	9
From the United States	33,103	17	6

IRON AND HARDWARE.

From Great Britain	260,467	14	5
From the United States	118,969	14	9

In reference to the above, his Lordship remarks that the manufactures of the United States "derive, no doubt, some advantage from contiguity;" but adds that he is disposed to believe, from all he can learn on the subject, "that their British rivals would keep their ground against them more effectually if they evinced equal zeal in acquiring a knowledge of the wants and tastes of their customers."

A trade, which is rapidly growing, has sprung up of late with the other British North American Colonies—between which and Canada there exists a treaty of reciprocity, admitting free of duty certain articles, the produce or manufactures of the colonies respectively, or directly imported therefrom:—

"The export of flour from Canada, *by sea*, to the British North American Colonies of Nova Scotia, New Brunswick, and Newfoundland, since 1844, has been as follows:—

Years.	Barrels.	Years.	Barrels.
1844	19,530	1848	65,837
1845	26,694	1849	79,492
1846	35,152	1850	140,872
1847	66,195	1851	154,766

The amount exported to these colonies, in bond, through New York and Boston, was—flour, 91,279 barrels; wheat, 6,798 bushels—making the total export to these colonies, 246,039 barrels—an increase of over twelve-fold in eight years." (Andrews, p. 414.)

How rapidly Canada is taking the place previously occupied by the United States in the supply of this important article to our fellow-colonists, will be seen by the subjoined table, which we copy from Andrews, p. 435:—

Year ending June 30.	American Flour.	Canadian		Total. Taken by Lower Colonies.
		Flour by Sea.*	Bonded *via* U. S.†	
	Barrels.	Barrels.	Barrels.	Barrels.
1846	310,091	35,152	.....	345,243
1847	272,299	66,195	.....	338,494
1848	274,206	65,834	7,454	347,594
1849	294,891	79,492	4,311	378,694
1850	214,934	140,872	39,723	394,429
1851	200,664	154,766	79,806	435,236

* Year ending December 31. † Year ending June 30.

This "substitution of Canadian for American flour in the consumption of the Lower Province, has been brought about," Andrews says, p. 414, "by the opening of the ship-canals on the St. Lawrence, aided by the reciprocity arrangement above-named, as existing between these colonies and Canada; and because the exclusion of the latter from the American domestic market has forced Canadian flour through the St. Lawrence, to compete in the foreign markets of the United States."

Though, for the sake of convenience, wheat and flour have been taken to illustrate the direction and distribution of the export trade of Canada, Mr. Andrews states that the remarks made by him apply to all other provisions of which she produces a surplus.

"In the import trade," he adds, "sugar, one of the leading articles of consumption, may be taken to illustrate a change as

favourable to Canada as that in the export of flour. In 1849 the value of sugars imported from the United States was double that from the Lower Colonies. In 1851, the value from the United States was $258,848, and from the colonies $269,300. In 1840, nearly half of the sugar was imported, inland, from and through the United States—the proportion being 5,152,000 pounds, out of the total importation of 11,613,000 lbs. In 1850 the importation rose to 15,736,000 pounds, of which the United States furnished 5,522,000 pounds, or a little more than one-third. In 1851 the number of pounds imported was 20,175,046, of which 5,640,000 pounds were from the United States, and 5,880,000 pounds from the lower colonies.

The imports of sugar into Canada in 1851 were—

From British Colonies	$269,300
" United States	258,848
" Other Foreign Countries	226,316
" Great Britain	171,140
	$925,604

With respect to the *route* of importation, the inland import in 1849, as we have seen, nearly equalled that by sea; but in 1851, the value of sugars imported by sea was $712,408, against $278,468 by inland routes. Canadian vessels load at the Lake ports with breadstuffs and provisions, which they carry, without transhipment, to Halifax, or St. John, Newfoundland, exchanging for a return cargo of sugars, molasses, fish, and oils." The fish and other products of Nova Scotia and New Brunswick, and the flour, provisions, &c., of Canada being exchanged, duty free, a direct free trade between the maritime and agricultural districts of British North America is now in operation, from which Newfoundland only is excluded —the necessities of that Government forbidding her from taking off the duty on Canada flour. Her fish and oil are, therefore, treated as foreign in the Canadian ports.

The subjoined statement shows the progressive imports into Canada of sugars from the British North American colonies:

1849.....	£28,716	...	$114,864
1850.....	51,317	...	205,268
1851.....	67,325	...	269,300

(Andrews, pp. 414-415.)

With foreign countries, other than the United States, Canada holds a commercial intercourse likely to become important ere long. From these, imports were received in 1852 to the value of £162,899 10s 11d; during which year there were also exported to them products to the amount of £47,123 16s 5d.

Besides 73 vessels from the United States, 1 from Bremen, 32 from Prussia, 3 from Sweden, 2 from Mecklenburg, 1 from Hamburg—58 from Norway, and 6 from Portugal—in all 176, with a tonnage of 71,409—entered at Quebec and Montreal in 1852. The number of foreign vessels in 1850 was 96, with 37,554 tons; and in 1851, 117, with 50,716 tons. The relative values for 1852 were—

Of Imports—Great Britain.....	£2,667,783	3	0	...	Exports—£1,426,614	5	4
"	West Indies.....	1,278	13	1	...	"	3,490	6	9
"	N. American Colonies..	120,238	10	7	...	"	203,034	15	11
"	United States.....	2,119,423	6	4	...	"	1,571,130	8	8
"	Other ForeignCountries	162,899	10	11	...	"	47,123	16	5

To the Exports to Britain have to be added £262,600 for ships built at Quebec, and sent over to the English market, thus bringing the amount up to £1,689,414 5s. 4d. (*American Statistical Annual* for 1854, pp. 481, 482—from Tables of Trade and Navigation for 1852.)

In 1852, 1729 vessels, with a tonnage of 564,242, and crews numbering 22,830 persons entered the Ports of Quebec, Montreal, New Carlisle, and Gaspe; from which ports there cleared during the same year 1,567 vessels, with a tonnage of 578,059; and 19,673 men and boys—making in all, entering and clearing, 3,296 vessels; 142,301 tons; and 42,476 persons.

To these must be added the traffic during the same years on the Canals,—on which the vessels going up, including British and Foreign, reached the number of 10,607, with 1,126,739

tonnage; and those going down, 10,017, with 1,160,252 tons. (*Amer. Statist. Ann.*, 1854, p. 483): total vessels, 2,624; total tonnage, 2,286,991. In 1853 the number of vessels up and down was 20,406; and the tonnage, 2,172,555. (Tables of Trade and Navigation for 1853, p. 31.)

The tonnage entering the country in 1850 (irrespective of of the internal trade) was 522,116; in 1851 it was 600,164: while 543,663 cleared in the former year, and 645,246 in the latter. (*Amer. Statis. Ann.*, p. 483.)

Of the Internal Trade and the Trade between Canada and the United States, the tonnage—inward and outward, British and Foreign—of 1853 amounted to 7,470,312. (Tables of Trade, &c., 1853, p. 473.)

The Revenue—rapidly growing—which Canada derives from her commerce is exhibited in the following statement of the Customs from Imports since the Union.

GROSS CUSTOMS REVENUE.

	£	s.	d.
In 1841	225,834	7	10½
1842	278,930	7	3½
1843	235,087	16	0½
1844	445,559	4	10½
1845	449,990	4	10½
1846	422,403	18	5¾
1847	413,248	19	6¼
1848	436,955	19	2
1849	443,531	2	4
1850	615,694	13	8
1851	737,439	0	2
1852	739,263	12	9
1853	1,029,782	15	4
During the first six months of 1854 it was.....	£565,671	9	8
The Inspector General estimated, when the Returns whence the above is taken were given in, the gross customs for 1854 at.....	£1,150,000	0	0

(Second Report of Standing Committee on Public Accounts—11th December, 1854—p. 15.)

The Ports named below yielded the following sums respectively for the years 1842, 1847, and 1852—to wit :

Places.	1842.	1847.	1852.
Quebec.....Gross	72,923 13 10	70,031 17 2	101,852 1 9
" .....Net	68,087 11 2	63,548 6 9	97,425 0 5
Montreal.....Gross	152,403 14 10½	171,285 7 7	333,298 16 11
" .....Net	149,491 6 6	165,756 15 6	326,460 15 6
Hamilton.....Gross	7,604 6 5	26,768 3 6	86,528 13 1
" .....Net	7,263 8 11	25,687 17 0	84,757 19 9
Toronto.....Gross	8,390 3 3	32,678 10 2	93,303 19 1
" .....Net	8,053 4 0½	31,266 7 5	91,334 2 8
Kingston.....Gross	6,826 10 4	17,584 19 6	21,737 8 10
" .....Net	6,510 7 7½	16,439 3 1	20,237 4 10

(Append. 1st Report, &c., p. 53—Public Accounts, 1852, p. 8–10.)

The collections in Hamilton and Toronto for 1853, as recently announced in the newspapers, have been—

Hamilton ..... £120,691 11 11 for 1853.
" ..... 169,129 8 6 for 1854.

Being an excess in 1854 over 1853 of £48,437 16 7, or about 45½ per cent.

Toronto ..... £157,026 0 0 for 1853.
" ..... 172,670 0 0 for 1854.

The increase being..... £16,644.

Within twelve years the Customs at Hamilton have thus risen from £7,604 6s. 5d. to £169,129 8s. 6d; and at Toronto from £8,390 3s. 3d. to £172,670.

In these facts we have striking evidence of the advance both of the country and of the cities named.

"The exports at the six principal Ports in the year 1850 and 1853 were as follows :

Quebec.....	1850,	£1,297,356	.....	1853,	£2,443,475
Montreal.....	"	436,193	.....	"	883,722
Toronto	"	67,557	.....	"	221,490
Hamilton	"	88,222	.....	"	206,719
Dalhousie.....	"	79,528	.....	"	182,188
St. Johns.....	"	303,959	.....	"	161,109

"The imports at the six principal Ports in 1850 and 1853 were :

Montreal.....	1850,	£1,726,356	.....	1853,	£3,381,539
Toronto	"	634,722	.....	"	1,605,056
Quebec.....	"	494,139	.....	"	1,141,594
Hamilton	"	395,782	.....	"	886,377
Kingston.....	"	87,562	.....	"	212,348
Stanley.....	"	33,849	.....	"	131,066

Thus it appears that for Exports the Ports take rank thus—Quebec, Montreal, Toronto, Hamilton, Dalhousie, St. Johns ; and for Imports, Montreal, Toronto, Quebec, Hamilton, Kingston, and Stanley. In Exports Quebec has made the largest absolute and Toronto the largest relative advance ; in Imports, Montreal has made the largest advance absolutely, and Hamilton relatively." (*Canadian Almanac*, 1855, pp. 44, 45.)

In proportion to population the tonnage of Canada more than equals that of the United States, and the number of hands employed on board the vessels engaged in her trade, all but does so. We have seen that in 1852, 3,296 vessels entered and cleared from the Ports of Quebec, Montreal, New Carlisle, and Gaspé, with a tonnage of 1,142,301, and crews numbering 42,476 persons.

Multiplied by ten, this gives 32,960 vessels ; 11,423,010 tons ; with 424,760 hands as the numbers required on the part of the United States to place them, in proportion to population, on an equality with Canada. The actual numbers in 1852—including American and Foreign, entering and clearing—were (according to *Amer. Statis. Annual* for 1854, pp. 56, 57), 38,876 vessels ; 10,571,045 tons, and 431,422 persons. Thus, while the vessels were 5,916, and the hands 5,622, over the required number, there was a deficiency in tonnage of 851,965. In point of size these figures show the vessels employed in the Canadian to have the advantage over those engaged in the American trade.

In regard to the activity with which the international trade is carried on between the two countries, Canada compares not

less favourably with her neighbour than she does in the extent of her transactions. Out of an inward tonnage of 2,412,028 in 1851, 1,047,628 tons are set down by Andrews (p. 33) as British; with 770,450 tons out of an outward tonnage of 1,677,438—1,818,078 out of 4,089,466 in all.

The amount of capital embarked in such a commerce as that carried on by Canada must be very large. In this connection it may, therefore, not be out of place to turn our attention for a moment to her Banking establishments, though unable to say what proportion their means or circulation may bear to her transactions.

The authorised Capital Stock of the eight Chartered Banks is as follows, the extension lately allowed to several of them being included :

Bank of Upper Canada	(sterling)	£1,000,000
Commercial Bank, M.D.		1,000,000
Bank of Montreal		1,250,000
City Bank, Montreal		375,000
Banque du Peuple, Montreal		300,000
Quebec Bank		350,000
Gore Bank, Hamilton		80,000
(Branches) Bank of British North America		1,000,000

The amount of capital stock paid in by the above Banks up to the periods named in 1854, was—

Bank of Upper Canada, Oct. 2d	£498,952	10	0
Commercial Bank, M.D., August 31st	500,000	0	0
Bank of Montreal, August 31st	1,000,000	0	0
City Bank, Montreal, August 31st	225,000	0	0
Banque du Peuple, Montreal, August 31st	200,000	0	0
Quebec Bank, November 6th	208,255	5	7
Gore Bank, September 30th	111,698	0	0
(Branches) Bank of B. N. A., Sept. 15th	1,196,534	16	10

The joint Liabilities of these Banks amounted in the fall of 1854 to £11,088,633 5 3

Joint Assets	11,426,153	8	7
Joint Circulation	3,849,577	12	6
Joint Deposits (bearing and not bearing Interest)	3,023,159	9	7

There was at the same time—

Specie in their vaults.....	£722,296	7	3
Debts due to them (Notes Discounted, Bonds, Mortgages, &c.)	9,642,679	4	4
Real estate possessed, Bank furniture,&c.	128,078	2	9

Though we have given above the full amount of capital *at present* authorized to be held, the general statement presented of the condition of the Banks has reference to the capital allowed previous to the additions lately granted. To enable our readers to form a correct estimate, we, therefore, add the late extensions, which they can subtract from the capital as above stated :—

Bank of Upper Canada, Bank of Montreal, and Commercial Bank to increase.....£500,000 each.
City Bank, Montreal..... 75,000
La Banque du Peuple..... 100,000
Quebec Bank. 250,000

Ten per cent. of the increase was ordered to be paid in when subscribing, and 90 per cent. by instalment; the Banks to dispose of the new stock. Their charters were extended from 1862 to 1870, and thence to the close of the then next Legislative Session. (Scobie's Almanac, 1852, p. 28, and 2d Report of Standing Committee on Public Accounts, pp. 83-86.)

Mr Moulson of Montreal and Mr. Zimmerman have lately received charters, and a Company in Niagara—the two last, if I am not mistaken, for £25,000 each, and the first for a larger amount.

In Quebec Canada possesses a first-class sea-port, nearer considerably than New York or New Orleans, to any port in Europe, Africa, or the Indian Ocean. From Liverpool its distance is, by St. Paul, 3,300 miles, or 3,000 by the Straits of Belle-Isle and the coast of Ireland; while that of New York is 3,475, and of New Orleans 5,300. From the Mediterranean New Orleans is distant 5,230 miles; New York 3,690; Quebec, by Cape Ray and St. Paul, 3,550—or by Straits of Belle Isle only 3,475. (Keefer's Prize Essay, pp. 68, 69.)

The best authorities unite in representing the notion which has prevailed in regard to the dangerousness of the navigation by Quebec as being very greatly exaggerated. On this subject Mr. Keefer speaks as follows in his very excellent Prize Essay on the Canals of Canada: "The difficulties and dangers of the Gulf navigation have been greatly over-rated; a nobler navigation, in ordinary weather, cannot be desired. The Gulf has three openings to the Atlantic,—the Northern one by the Straits of Belle Isle, ten miles wide, which if lighted would form the shortest and safest route for the Fall Trade with Europe, because the heavy fogs which overhang the Southern routes are seldom encountered in the Northern Channel. The middle passage, fifty miles wide, divides Newfoundland and Cape Breton; and the third outlet, which is called the Gut of Canso, affords to us a short and sheltered communication with Halifax. From the Atlantic to the Pilot ground at Bic, (153 miles below Quebec,) the channel is no-where less than twenty-five miles wide, and generally from fifty to seventy-five miles, and without anchorage."

After adverting to the chief difficulties of the passage, which are, in his opinion, the want of a harbour of refuge between the Atlantic and the Pilot ground, and deficiency of lights, he continues: "The Gulf of St. Lawrence, we believe to be naturally a much less dangerous route than either the British or Irish Channels, and if half as well lighted and furnished, would, with only occasional exceptions, be a safe, speedy and well-supported navigation. The disadvantages are such as human ingenuity and perseverance can cope with and alleviate. A harbour of refuge near Matane, and a light and fog whistle upon Cape Rozier, are the most important requirements. More steamers, lights, buoys, harbours and relief Stations, will soon add the Gulf route to the many examples of successful commercial intelligence and perseverance. (Pages 61–65.)

Mr. Andrews in his Report to the Senate of the United States, to which we have been already so largely indebted, ex-

presses himself not less favourably than Mr. Keefer as to the Quebec route.

"The harbour of Quebec," he says, "is not unlike that of New York—the Island of Orleans serving as a barrier from a north-east sea, and, like Long Island, affording two channels of approach. A frontage of about fifteen miles on both sides of the river not only affords the necessary wharves, but coves of sufficient magnitude to float some thirty to forty millions of cubic feet of timber, about eighty millions of superficial feet of deals, besides staves, lathwood, &c. A *fresh* water tide, rising eighteen feet at "springs," offers no impediment to the shipment of timber, the great business of the Port, the vessels so engaged being anchored in the streams, (which affords good holding-ground,) where their cargoes are floated to them at every tide. The tide extends ninety miles above Quebec, and the water does not become perfectly salt until an equal distance is reached below; thus there is a fresh-water tide of one hundred and eighty miles beyond the salt water, and sea navigation to Montreal, ninety miles further, or two hundred and seventy miles from salt water. The river navigation may be said to terminate about one hundred and fifty miles below Quebec, (where pilots are first taken,) but the continued Gulf and River navigation extends upwards of seven hundred miles before we reach the Atlantic, with which it has no less than three connections. The most northern of these—the Straits of Belle-Isle—is in navigable order about five months, and affords a passage to Liverpool more than two hundred miles shorter than the route by Cape Race, making the distance from Quebec more than four hundred miles shorter than from New York. By using this passage the navigable route between the foot of Lake Ontario and any Port in Britain is as short as that from New York Harbour to the same port. The middle Channel, by which the Atlantic is reached, is about fifty miles wide, and contains St. Paul's Island, which, with its two light-houses, affords an excellent point of departure. By this Channel Quebec is brought nearer to any port

in Europe, Africa, or the Indian Ocean than New York. The Southern passage is known by the name of the Gut of Canso, and is invaluable to the fishing, coasting, or West India trade."

"The trend of the Atlantic coasts of Newfoundland and Cape Breton," it is added, "converge upon St. Paul's Island, a lofty and picturesque rock, for which a vessel may stand bold in a fog. Inside of St. Paul's, a bank, with sixty fathoms, leads, by a direct line on its outer edge, clearing Anticosti, into the Chops of the St. Lawrence; northward of this line is deep water; southward, regular soundings; so that, in thick or foggy weather, the lead is an unerring guide. On entering the river, the south shore gives uniform soundings all the way to the pilot ground, the water shoaling so regularly that a vessel may at any point determine her distance from the shore within a mile by the lead alone, while at all points she may approach this shore within this distance. The admirable position of Pointe des Monts, (with a lighthouse one hundred feet above the water,) projecting with a bold shore several miles from the general trend of the north shore, forms, with its anchorage on both sides, a common point of departure for inward and outward-bound vessels.

The recent application of steam to ocean commerce greatly enhances the value of this navigation; particularly with reference to communication with Britain, the great centre of European steam navigation and commerce. The two great drawbacks to ocean steam navigation are, the quantity of fuel which must be carried, and the resistance which a heavy sea offers to progress, whether the wind be fair or foul. On the St. Lawrence route these are reduced to a minimum. The distance from the coast of Ireland to St. John, Newfoundland, or to the Straits of Belle-Isle, is under 1,700 miles; and coal is found in abundance. and of excellent qualities, at several points in the Gulf of St. Lawrence. The remainder of the voyage to Quebec will be made in comparatively smooth water, as the steamer will run under the shelter of either shore, according to the direction of the wind." (Pp. 116–118.)

The importance of these extracts, enhanced as their value is by the position of the gentleman from whom they are taken and the appearance of his very admirable Report under the authority of the United States Senate, will, we are sure, be deemed more than a sufficient apology for their length.

According to Mr. Keefer, "the greatest number of the disasters" which were wont to occur in the St. Lawrence, were attributable to an over-anxiety on the part of the Montreal traders "to get the first cargo in," who exposed themselves to the ice by leaving Britain about the 20th of March. Of late years, he states, these disasters, which in one year were as many as forty or fifty out of 1,500 arrivals or 3,000 voyages in and out, "have almost disappeared, not having reached five in nearly the same number of voyages." The improvement which has taken place in the character and navigation of the vessels employed in the trade is named as having further contributed to the diminution of the casualties.

Mr. Andrews unites with Mr. Keefer in averring that even during the existence of the drawbacks above referred to, now so rapidly disappearing, "the per centage of losses" by the St. Lawrence has been no greater, considering that over half a million of tons of shipping annually enter it, than that of the British or Irish Channels, or the Keys of Florida. In 1850, he states the number of disasters within the Gulf and River to have been eleven, the number of vessels entering inward and outward having been 3,125, carrying 1,213,142 tons, with 40,786 men—consequently not much over one-third per cent. The disasters at Keywest were, according to him, about fifty for the same year; and on the Upper St. Lawrence, between Lake Superior and Montreal, two hundred and sixty-three. Six hundred and eighty-eight vessels, he adds, numbering 125,726 tons, and four steamers, giving 1,462 tons, form the list of wrecks of vessels belonging to the United Kingdom for 1850. (p. 417.)

Of Montreal, Mr. Andrews remarks that although not accessible, like Quebec, to the largest class of shipping, its position

for a varied and extensive commerce is more commanding, inasmuch as it is the centre of a more fertile area, more numerous approaches, and possesses within itself every requisite for a large population.

The quays of Montreal he states to be unsurpassed by those of any city in America; built of solid limestone, and uniting with the locks and cut-stone wharves of the Lachine Canal, they present, for several miles, a display of continuous masonry, which has few parallels. Like the levees of the Ohio and Mississippi, no unsightly warehouses disfigure the river-side. A broad terrace, faced with grey limestone, the parapets of which are surmounted with a substantial iron-railing, divides the city from the river throughout its whole extent. Montreal, it is added, occupies the centre of an extensive plain, cut in every direction by the St. Lawrence and the Ottawa, with their tributaries, forming large and fertile islands contiguous to the main one occupied by the city. This plain, although nearly one thousand miles by the river from the Atlantic, is scarcely elevated one hundred feet above tide water, and, in the words of the Provincial Geologist, "constitutes the valley proper of the St. Lawrence, occupying a breadth of forty miles; the nature of the materials of which it is composed (a deep and highly levigated deposit of argillaceous, arenaceous, and calcareous matter) rendering it impossible to conceive of a region more fitted for the purposes of agriculture." (pp. 474, 425.)

Besides these two grand emporia, Canada possesses about sixty-eight inland ports, thirty of which were in 1852 warehousing ones, (Andrews, p. 428); since which time, others have come to the enjoyment of the same privileges. "Of these the trade of the greater number is exclusively with the United States, either in domestic or bonded articles. But the more important lake ports are rapidly establishing a direct trade with the Gulf ports and the lower colonies, and very probably will soon engage in the fisheries, for which they can fit out and provision at the cheapest rates."

With Britain Canada enjoys the advantage of a free trade. A similar advantage she has enjoyed for some time (since 1850) with the Lower Provinces, in respect to the following articles, to wit, animals, salted and fresh meats; bark; butter; cheese; chocolate, and other preparations of cocoa; copper; earth; fruits; firewood; fish; fish oil; fins and skins the produce of fish or creatures living in the sea; grain and breadstuffs of all kinds; grindstones and stones of all kinds; gypsum, ground or unground; hay and straw; hops; hides, horns; head, matter and blubber of creatures living in the sea; iron, in pigs and blooms; lard; lead in pigs; lime; ores of all kinds; ochres; rock salt; seeds; spermaceti oil; tallow; timber and lumber of all kinds; train oil; undressed skins and furs of all kinds; vegetables; wool, and wood. (Canadian Almanac, 1854, pp. 75-76.) By the treaty of reciprocity recently entered into with the United States, she has also obtained a free trade with that country in the articles subjoined, being of the growth or produce of the countries reciprocating, namely, grain, flour, and breadstuffs of all kinds; animals of all kinds; fresh, smoked, and salted meats; cotton, wool, seeds, and vegetables; undried fruits, dried fruits; fish of all kinds; products of fish and all other creatures living in the water; poultry, eggs, hides, furs, skins, or tails undressed; stone or marble in its crude or unwrought state; slate; butter, cheese, tallow, lard, horns, manure; ores of metals of all kinds; coal, pitch, tar, turpentine, ashes; timber and lumber of all kinds, round, hewed, or sawed, unmanufactured in whole or in part; firewood; plants, shrubs, and trees; pelts, wool; fish oil; rice, broom corn, and bark; gypsum, ground and unground; hewn or wrought or unwrought burr or grindstones; dye stuffs; flax, hemp, and tow unmanufactured; unmanufactured tobacco. The above articles are admitted into each country respectively free of duty. "It is further agreed, that British subjects shall have the right freely to navigate Lake Michigan with their vessels, boats, and crafts so long as the privilege of navigating the river St. Lawrence,

secured to Americans by the fourth article of the treaty, shall continue; and the Government of the United States further engages to urge upon the State Governments to secure to the subjects of her Britannic Majesty the use of the several canals on terms of equality with the inhabitants of the United States." (Reciprocity Treaty, Canadian Almanac, pp. 39, 40.)

Over and above the more solid advantages which Canada may fairly hope to reap from the treaty thus so happily concluded with the United States, and now in operation in effect, though not yet formally proclaimed,* the fact of its being entered into by that country, taken in connection with the unanimity with which it was assented to, is a proof not to be mistaken of the opinion which her neighbours have come to entertain of her. It is but a few years since the idea of such a treaty was scouted as an absurdity, and Canada scowled upon as an impudent beggar, who had the effrontery to ask that for which she had no equivalent to give. The treaty has been gracefully conceded at last, from the conviction, openly expressed, that the benefit to be secured by it is mutual.

5. Canada has provided, and is now providing for herself, through means of her public works—completed, in progress, and projected—facilities of intercommunication, which will do much to secure for her the full advantage of the varied and superabounding resources with which the munificence of the Creator has gifted her.

Though large sums have been expended on Roads and Bridges (amounting as per Public Accounts for 1852, p. 168, to £510,440 16s. 6d. for Upper, and £303,251 11s. 7d. for Lower Canada), on Harbours and Light-houses (which cost up to the close of 1852 £274,256 12s.), and a variety of other works of more or less importance, our present reference is chiefly to our Canals and Railroads.

Of the former those claiming special notice are the Welland and St. Lawrence Canals.

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* It has been proclaimed since the above was written.

The Welland Canal "extends from Lake Erie to Lake Ontario, and overcomes the interruption to the navigation caused by the Falls of Niagara. It has two entrances from Lake Erie, about seventeen miles apart; the upper entrance being from the Grand River, a little above Port Maitland, about thirty-seven miles west from Buffalo, and the lower at Port Colborne, about twenty miles west from Buffalo. It also communicates with the Grand River by a branch commencing on that stream at Dunnville, five miles above Port Maitland, through which branch the whole Canal has hitherto been supplied with water. The termination on Lake Ontario is at Port Dalhousie. The Port Maitland entrance has an advantage in spring over the Port Colborne, in being clear of ice several weeks before either that or Buffalo Harbour." (Report of Commissioners of Public Works for 1848, p. 53.)

"The work was originally undertaken by a Company, for which an Act was obtained in the year 1824, with a capital of £37,500." In the year following another Act was obtained providing for the enlargement of the works and the increase of the capital to £200,000, which was extended in 1834 to £250,000. Stock to the extent of £25,000 was taken in it by Lower Canada in 1827. At the close of 1834 Upper Canada held £107,500 stock in it, besides having loaned it £100,000. From the Imperial Government also it had received a Loan of £55,555. In 1837 the Loans made to it by Upper Canada were converted into Stock, and in 1839 the Government were authorised by the Legislature to purchase the Stock of private holders, for which purpose debentures were issued, "redeemable in twenty years from their date, bearing interest at the rate of two per cent. for the first two years, three per cent. for the third year, four per cent. for the fourth, five per cent. for the fifth, and six per cent. for the sixth and following years." About £500,000 is supposed to have been expended on the work previous to its coming into the hands of the Government. In 1841 a commencement was made of the improvements and enlargements which are making it now

of so much value to the Province. Its cost, as stated in the Public Accounts for 1852, has been in all £1,644,536 12s. 2d.

This noble Canal, which will constitute the monument of its spirited projectors when they shall have "gone the way of all the earth," is 28 miles in length, has a descent of 334 feet, through 37 Locks of 150 feet in length and 26½ in width, and is "passable from lake to lake by vessels of 134 feet over all, 26 feet beam, and 9 feet draught, stowing 3,000 barrels under deck." (Andrews, p. 226—and Keefer, p. 20.)

The St. Lawrence Canals comprehend—

1. The Williamsburg Canals,—four in number, with six Locks,—"lying between Prescot and Dickenson's Landing, constructed for the purpose of overcoming the Rapids at the Galops, Point Iroquois, Rapid Plat, and Farren's Point."

2. The Cornwall Canal, whose object is "to overcome the difficulties to the St. Lawrence, presented by the Long Sault Rapids." . . "The Locks are the largest in Canada, having a chamber 200 feet long and 55 feet wide, in the clear; the depth of water in the sills being nine feet as in the other large Canals of the Province."

3. The Beauharnois Canal, which, "extending from the lower end of Lake St. Francis, overcomes the Rapids of the Coteau, the Cedars, and the Cascades;" and

4. The Lachine Canal, which "extends from the village of Lachine, at the foot of Lake St. Louis, to the City of Montreal, overcoming the various Rapids in the St. Lawrence between the two places." Its length is between eight and nine miles; it has seven Locks of cut stone, 100 feet long by 20 feet wide in the clear, and gives passage to vessels drawing five feet water. (Report, &c., for 1848, pp. 54, 55.)

In the Public Accounts for 1852 the united cost of these Canals is set down at £1,592,408 7s. 4d.

In addition to the above the following claim notice as works of general importance.

1. The Chambly Canal, which "extends from St. John's to Chambly, a distance of about eleven and a half miles, and was made to overcome the interruption in the Channel of the Richelieu between the two places. It forms the chief portion of the works necessary to connect the navigation of the River St. Lawrence, by way of the Richelieu, with that of Lake Champlain." Its cost has been £103,836, according to the Public Accounts for 1852.

2. St. Our's Lock, &c.

"This Lock is in the River Richelieu, at the foot of the artificial navigation, about fourteen miles from its mouth, and with a Dam raises the water above it sufficiently to overcome the shallow portions of the stream, and afford a free passage to Chambly Basin. In conjunction, therefore, with the Chambly Canal, this Lock opens a communication between the St. Lawrence at Sorel, and Lake Champlain; while, by the Northern Canal, the communication is continued from White-Hall to the navigable waters of the Hudson, near Troy. At the site of the work the Richelieu is divided into two deep channels by a small island, in the eastern and narrowest of which the Lock is built, while the Dam extends across the western. . . The length of the Lock is 200 feet, by a width of forty-five feet, with six feet of water on the sill."

3. St. Ann's Lock.

This Lock is situated on one of the branches of the River Ottawa, between the village of St. Anns and Isle Perrot, about twenty-five miles west of Montreal. It overcomes the St. Ann's Rapids, and thus, in conjunction with the Lachine and the Ottawa Military Canals, opens a communication from Montreal to Bytown, and thence by the Rideau Canal to Kingston. . . The Lock is 190 feet long, by forty-five feet wide, with seven feet of water on the sill in the ordinary

state of the river during summer, and six feet at its very lowest state."

4. The Burlington Bay Canal, which opens the passage from Lake Ontario up to Hamilton, and whose cost has been £52,773 7s. 2d.

On the Improvements of the Ottawa, including the Slides, £115,735 2s. 10d. have been spent, and £139,626 11s. on the Improvements of the Trent. On the Improvement of Lake St. Peter there have been expended £75,358 15s. 5d., with considerable sums on other Works. (Report of Commissioners, &c., for 1848, and Public Accounts for 1852.)

The following Tables show the amount and character of the business done on these Canals in 1852, as also the Returns rendered by them :—

BRITISH VESSELS AND STEAMERS.

Canals.	Going up.		Going down.	
	Vessels.	Tons.	Vessels.	Tons.
Welland Canal.....	1,678	174,336	1,391	147,192
St. Lawrence Canals.	3,949	299,315	3,514	338,049
Chambly Canal	380	19,360	717	35,678
Burlington BayCanal	1,221	203,197	1,188	197,064
Total	8,380	756,765	7,682	765,635
From British to British Ports	7,160	634,860	6,098	636,835
From British to Foreign Ports	570	50,580	738	70,695
From Foreign to British Ports	645	70,337	843	57,946
From Foreign to Foreign Ports.....	5	288	3	159

FOREIGN VESSELS AND STEAMERS.

Canals.	Going up.		Going down.	
	Vessels.	Tons.	Vessels.	Tons.
Welland Canal.....	1,471	264,410	1,915	308,307
St. Lawrence Canals.	66	3,160	54	2,935
Chambly Canal.....	415	24,180	124	5,299
Burlington BayCanal	270	78,104	267	77,856
St. Anne's Locks.....	5	220	5	220
Total	2,227	369,974	2,365	394,617
From British to British Ports.....	20	1,408	11	578
From British to Foreign Ports.....	559	40,184	1,008	144,062
From Foreign to British Ports.....	482	90,535	270	19,443
From Foreign to Foreign Ports.....	1,166	273,647	1,076	230,534
Grand Total. British and Foreign.....	10.607	1,126,739	10,017	1,160,252

Quantities of each species of property passing through, and on the Canals, during the year 1852 :—

Property.	Welland.	St. Lawrence.	Chambly.	Burlington Bay.	St. Ann's Locks.
Vessels of all kinds, —Tons.....	894,193	585,466	82,618	556,222	108,649
Passengers—No.....	6,543	36,922	1,993	...	18,148
Forest products–tons	210,968	275,490	67,875	19,080	85,566
Live Stock.....	65	1,680	1	180	243
Animal products.....	6,292	4,876	68	856	1,005
Vegetable Food.....	223,318	99,196	9,180	26,820	977
Other Agricultural products.....	1,181	3,329	2,177	224	123
Manufactures.....	159,694	80,280	4,692	14,413	6,971
Merchandise.....	41,548	27,796	3,512	13,620	4,169
Total, exclusive of Passengers&Vessels	743,060	492,575	87,514	75,411	99,054

Revenue derived from the Canals during the year 1852 :—

Canals.	Vessels.			Passengers.			Merchandize.			Total.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Welland	4,740	2	6	48	2	10	51,136	5	0	56,924	10	4
St. Lawrence....	1,741	0	6	654	3	6	18,771	19	4	21,167	3	4
Chambly	202	1	2	7	5	2	1,698	12	0	1,907	18	4
Burlington Bay.	378	7	6	0	0	0	4,675	7	3	5,053	14	9
St. Ann's Lock...	339	10	7	37	16	2	396	1	8	773	8	5
Total	7,401	2	3	747	7	8	77,678	5	3	85,826	15	2

Gross Revenue, from all sources, including Fines, Rents, Storage, &c.			£89,285	8 9
Which is charged with, Salaries.....	£15,209	19 7		
" " Toll refunded	1,224	8 2		
" " Repairs.....	16,830	6 6		
			33,264	14 3
Net Revenue, all incidental Expenses deducted.....			£56,020	14 6

(*Amer. Statist. Annual*, 1854, pp. 483, 484.)

As stated by the Board of Registration (Ap. 1st Report, 1849, p. 56), the gross revenue of these canals was, in 1842, £18,535 16s 11d; in 1843, £25,751 18s 6½d; in 1844, £38,347 0s 0¾d; in 1845, £28,957 10s 6½d; in 1846, £39,340 8s 1d; in 1847, £50,131 16s 1½d. In 1852, the gross revenue was nearly four and a half times what it had been in 1842—a progress which must be admitted to be satisfactory in a very high degree.

The returns for 1853 show a continued advance, being as follows:—

BUSINESS ON CANALS FOR 1853.

	Welland.	St. Lawrence.	Chambly.	Burlington.	St. Ann's Lock.
Passengers.....	19,631	43,861	2,953	——	17,805
Tons of Goods..	905,516	561,601	113,585	87,858	131,159
Vessels of all kinds.....	1,075,218	620,399	113,626	327,658	126,204
Tolls	£65,034	£22,108	£2,126	£5,625	£919

The entire Revenue from *Rents* and *Tolls* on all the Canals for 1853 was £103,687. Including repairs, the charges amounted to £41,751. Hence the Net Revenue was £61,953. The increase on all the Canals during 1853 is 27 per cent. (*Canad. Alm.*, 1855, p. 44.)

From the Table of Tolls chargeable on the Canals we extract the following particulars: On the Welland Canal vessels of all sorts pay 1½d. per ton each way; on the St. Lawrence 1½d. up, and 0¾d. down; Chambly and St. Our's Lock, each way 0¾d. Total charge from Lake Erie to Lake Champlain, 3d. On St. Ann's Lock the charge is 0¾d. each way.

On passengers twenty-one years of age, and over, the charge is 6d. each way on the Welland; 6d. up and 3d. down on the St. Lawrence; Chambly and St. Ours Lock, each way, 3d.; from Lake Erie to Lake Champlain, 1s.; on St. Ann's Lock, each way, 0½d. With the exception of St. Ann's Lock, which makes no difference, the charge on passengers under 21 years is half the above rates.

For the Tolls chargeable on articles of merchandize, which are arranged into classes according to their nature, see *Can. Alm.*, 1855, pp. 73, 74.

For the accommodation of those who require to pass only a portion of the way, each Canal is divided into so many sections, for each of which a proportion of the rate is charged —varying from five-eighths to one-eighth.

The following articles having paid full tolls through the St. Lawrence Canal, are passed FREE through the Welland Canal; and if they have previously paid tolls through the Chambly Canal, the amounts paid are refunded at the Canal Office, Montreal:

Iron of all kinds and salt; and the following articles having paid full tolls through the Welland Canal, are passed FREE through the St. Lawrence and Chambly Canals: viz., wheat, flour, and corn.

Iron ore through the whole line of Canals, upwards or down

wards, or through any one Canal, is charged 3d. per ton; and proportionately for one or more sections of any one Canal.

Vessels and freight passing less than one section is charged for one section. (See Table, *Canad. Alm.*, 1855, p. 73, 74.)

From Mr. Andrews Report (p. 437–443) we make the following extracts, the importance of which will, we presume, much more than compensate for their length.

"There is no country which possesses Canals of the magnitude and importance of those in Canada.

The St. Lawrence Canal was designed for paddle-steamers; but from the magnitude of the Rapids and their regular inclination, the aid of the Locks is not required in descending the river. Large steamers, drawing seven feet water, with passengers and the mails, leave the foot of Lake Ontario in the morning, and reach the wharves at Montreal by daylight, without passing through a single lock. At some of the Rapids there are obstacles preventing the descent of deeply-laden craft, but the Government are about to give the main channel in all the Rapids a depth of ten feet water, when the whole descending trade by steam will keep the river, leaving the Canals to the ascending craft.

The time required for the descent of a freight-steamer from the head of Lake Ontario to Montreal is forty-eight hours; the rates of freight have ranged from twelve-and-a-half cents (the lowest) per barrel, for flour, to twenty-five cents, including tolls. The upward trip requires about sixty hours, and the freight per ton ranges from $1 50c. to $3 for heavy goods. The ruling freight on Railroad iron last year (1851) from Montreal to Cleveland was $2 50c. per gross ton, and for the return cargo of flour thirty cents per barrel, tolls included in both cases.

These rates are yet fluctuating as the long voyage is new, and are so much influenced by the amount of up-cargo obtained, that they cannot yet be considered as settled. It is believed that the freight on flour from Lake Erie to Montreal (including tolls) will be brought down to twenty cents, and on iron up to $2."

Speaking of the construction of a Ship-Canal from the St. Lawrence to Lake Champlain, so as to bring the propellers of Chicago to Burlington and White-Hall—which he describes as contemplated—he says, "the construction of such a work must produce a corresponding enlargement of the Northern New York Canal, whereupon there will be a connection between Lake Erie and tide-water on the Hudson, *via* St. Lawrence, which may be navigated, without transshipment, downward in *four*, and upward in five days."

"The returns of Trade on the Canadian Canals give indication of decided and satisfactory progress in the leading articles of up and down freight."

The Down Trade of the Welland included in 1850 and 1851, over and above all other articles—

Wheat.....	in 1850,	3,232,986	bushels ;	1851,	4,326,336
Corn.....	"	575,920	"	"	1,553,800
Flour.	"	396,420	barrels ;	"	525,170
Coals.....	"	5,053	tons ;	"	6,462
Hams, Lard, and Lard Oil.....	"	3,982,720	pounds ;	"	8,485,120

These figures, it is stated, do not show the whole amount of the increase,—the column for 1850 including the whole of the Down Trade, while that for 1851 gives only the entries at Port Colborne,—"the whole down Trade not being attainable."

The Up-Trade in the articles under-named was as follows :

Railroad Iron.....	1850,	75,803,840	pounds ;	in 1851,	156,784,320
Cast & Wrought Iron, Nails and Spikes..	"	16,468,400	"	"	26,093,760
General Merchandize	"	17,958,080	"	"	24,064,320
Sugar, Molasses, and Coffee.....	"	7,781,760	"	"	19,350,320
Pig and Scrap Iron...	"	6,648,320	"	"	14,519,680

The comparative movement of leading articles on the St. Lawrence Canals for 1850 and 1851 was as follows :

DOWN-TRADE.

Flour	in 1850,	643,352	barrels ;	in 1851,	731,412
Wheat.....	"	415,510	bushels;	"	654,731
Corn	"	75,480	"	"	122,310

UP-TRADE.

Railroad Iron.....	in 1850,	39,179,480	pounds ;	in 1851,	61,900,160
Pig and Scrap Iron..	"	22,077,440	"	"	22,723,120
Wrought Iron, Nails and Spikes.....	"	20,742,400	"	"	25,527,040
Stone, Glass, and Earthenware.....	"	4,079,040	"	"	5,723,838
Coal.....	"	1,282½	tons ;	"	2,468
General Merchandize	"	(No return)	pounds ;	"	28,913,920

"A most decided proof," he continues, "of the success of the Canadian Canals is to be found in the frequent and important reductions which have been made in the tolls of the Erie Canal since 1845, the year in which the enlarged Welland Canal first came into serious competition with the route through Buffalo. The policy of the State of New York has been not only to obtain the largest possible revenue from her Canals, but also to protect her own manufactures and products against competition from other quarters ; and this she has been enabled hitherto most effectually to accomplish, by levying discriminating tolls. Thus, foreign salt was excluded from the Western States by a rate of toll about twice its whole value. The toll upon this article in 1845 was three cents per 1,000 lbs. per mile, or $21·78 per ton of 2,000 lbs. (about $3 per barrel) ; while the toll upon New York State salt was only one-thirteenth part of that upon the foreign article. In 1846 (the first year after the opening of the enlarged Welland Canal), the tolls on foreign salt were reduced one half, and a still greater amount on New York State salt. The next year a further reduction of thirty-three per cent. took place ; and in 1850 the toll was again reduced one-half, so that it is now only *one-sixth* the rate charged in 1845 ; but it is still subject to a tax five times as great as that paid by New York State salt.

"In like manner, railroad iron, in 1845, paid a toll of nine mills ; in 1846, this was reduced to five mills ; in 1850, to four mills ; in 1851 to two-and-a-half mills ; and in 1852, to one-and-a-half mills. Almost every other article of heavy goods and merchandize for up-freight has likewise undergone frequent

and heavy reductions in toll on the Erie Canal, since the Welland and St. Lawrence came into competition with it."

After noticing reductions on a multitude of other articles, Mr. Andrews states that "there can be no question but that the whole western country would have been annually taxed, both upon their exports and imports, a much larger sum than is now paid by them, in order to swell the revenue of the Erie Canal, had it not been for the healthful competition of the Canadian works."

In the article of railroad iron alone, it is stated that the Western States are now saving over half a million of dollars annually, in conseqnence of this Canadian competition. For example, in 1851, the amount of this article which reached Lake Erie was:—

By Erie Canal to Buffalo.....	46,876,427 lbs.
By Welland Canal to Lake Erie.	156,784,320 lbs.
	203,660,747 lbs.

equal to 101,830 tons of 2,000 lbs. The reduction in toll was thus $553,955 20c.

By the late Hon. Robert Rantoul, jun., M.C., it was estimated that for the five years next following 1851, the northwest will require 100,000 tons of Railroad iron annually.

The reduction on wheat and flour shipped eastward from the West in 1851, amounted, from the same cause, to $512,830 as compared with the tolls of 1845.

"Thus the Eastern States, in their imports of three articles from the West, as well as the western ones, in their importation of one article from the East, have each obtained a reduction of transit dues amounting to over half a million of dollars, which is mainly to be ascribed to the construction of the Ship-Canals of Canada."

From the same cause a diversion has taken place of the western trade from Buffalo to Oswego, by which, according to the statement of the auditor of the New York Canal department, in his Report for 1850, the revenues of the Canal have been "considerably affected."

RAILROADS.

Canada bids fair to stand as pre-eminent ere long for her Railroad communications, as she is acknowledged to do already for her Canals. Though not the oldest, the Grand Trunk Line is entitled to be noticed first on account both of its magnitude and importance. Including the Atlantic and St. Lawrence Line, of which it has lately obtained a lease, its length, when completed, will be 1,112 miles. Three hundred and ninety-two miles of this Road is already in operation, viz., from Portland to Montreal 292 miles, and 100 from the Richmond Junction to Point Levi or Versailles, opposite Quebec. "By the 1st of September next the Contractors are under engagement to have in operation 165 miles additional, and by the 1st of October 130 miles more, making a total of 295 miles to be opened in 1855," thereby bringing the Grand Trunk up to 687 miles. "In 1856, 160 miles further will certainly be completed. This will complete a Railway link, *via* Canada, between Maine and Michigan. Detroit will be distant from the Forest City 872 miles by this route, which is at least 50 miles less than by the way of New York, and as the whole line will be under one continuous system of management, passengers or freight will necessarily be carried cheaper and more expeditiously than by any series of lines not possessing the advantages of combination and continuity. The remaining 257 miles, being perhaps the least important sections, and the construction of which will admit of delay with least inconvenience to Canada, will be undertaken as soon as the money market becomes easier; but under any circumstances, the Contractors are under obligations to complete all the Lines, and the Victoria Bridge, not later than the 1st of January, 1860." (*American Railroad Journal*, January, 1855,—from *State of Maine* Newspaper.)

The *American Railroad Journal* describes the portion of this Road which runs through the State of Maine as admira-

bly constructed. Its earnings for the week ending July 22d, 1854, were $15,559 58c. From the 1st of January, 1854, they had been $405,928 75c.

[The milcage expected to be open for traffic by the autumn of the present year is, according to Sir Cusack P. Roney, 643. "This summer, trains will run from Quebec to Boston, *via* Portland (421 miles) in fifteen hours. Last summer it took, by the then existing routes, thirty-seven hours to perform the same distance." The opening of the section of the Road between Montreal and Brockville (expected to take place by September next), "will convert a journey of twenty-four hours against stream, and of eleven hours with the current, into one of about four and a half hours." On the completion of the Grand Trunk, Toronto will be reached in twelve or thirteen hours from Montreal (the distance by Railway being 333 miles); and Hamilton in from fourteen to fifteen hours. In consequence of the opening of the Line between Montreal and Portland, the country is already filling up rapidly between these cities, large clearances have taken place, "and villages are springing up adjacent to the numerous rivers and streams which run in the vicinity of the Line. 28 saw-mills have already been built, and others are either planned or in course of construction. Those now existing are, when in full operation, capable, for the greater part of the year, of sawing 500,000 feet a day, all of which will be conveyed on the Railway. Allowing each of these mills to cut treble their present amount, it is calculated that it will take 70 years to clear the timber lands in the vicinity of the line; and with cleared lands will come increased settlement, population, and traffic."

The traffic receipts, in sterling, were for the

"Half-year ending 31st December, 1853, £54,615.
" " " July, 1854, 72,831.
" " " December, " 97,917.

The receipts for the first thirteen weeks of 1854 were, £29,559. For the first thirteen weeks of 1855 they were, £38,852,—showing an increase of £9,292 in that period."

"The population on and within 15 miles of the Grand Trunk Railway is about a million and a-half, and is rapidly increasing." Making the most ample allowance for competition by water, the average contribution of each resident within its influence (found to amount in the case of the United States Railways to 12s. 6d. per annum) "can fairly be estimated for the Grand Trunk at 8s. a-head, which will give an annual income from this source of £600,000."

Sir Cusack Roney's Report to the London Board of Directors, bearing date London, 16th April, 1855, given in the Toronto *Leader* of May 30th, 1855."]

The Victoria Bridge, by which the Grand Trunk is to cross the St. Lawrence at Montreal, will be "one of the most stupendous and imposing works in the world." Its total length is to be 7,000 feet, consisting of twenty-four spans of 242 feet each, with one of 330 over the Navigable Channel of the River, at at an elevation of 60 feet above the summer water level. Mr. Ross, the Engineer, describes it as consisting of a "wrought-iron box, 20 feet deep, 16 feet wide, and about 7,000 feet in length; supported at intervals of about 260 feet, by towers of stone, and open at both ends to admit of the trains passing through it, and made of sufficient strength to carry six times the heaviest load hitherto known to travel on Railways in this or any other country." Its estimated cost is £1,400,000. Of this work, the undertaking of which by a country so young as Canada must be admitted to give evidence of a very large amount of spirit, a considerable portion is already in a state of forwardness. (*Canadian Journal*, June, 1854.)

Next in importance to the Grand Trunk comes the Great Western, which runs from Windsor, on the Canadian side of the Detroit River, opposite the city of that name, to Niagara Falls, where it connects by a gigantic Suspension Bridge thrown across the Niagara River, about two miles below the Falls, with the System of Railways in the State of New York,

which run from Lake Ontario towards the tide-water of the Hudson River. (*Amer. Railroad Journal,* Jany., 1855.)

The Suspension Bridge above alluded to consists of a single span 800 feet in length, elevated 18 feet on the Canadian, and 28 on the American side, above the surface of the bank, being the same height above the passenger Bridge previously existing. It forms a "straight hollow beam of 200 feet wide, and 18 deep, composed of top, bottom, and sides. The upper floor, which supports the Railroad, is 24 feet wide between the railings, and suspended to two wire cables assisted by 18 wire-rope stays. The lower floor is 19 feet wide, and 15 in the clear, connected with the upper one by vertical trusses, and suspended on two other cables, which have 10 feet more deflection than the upper ones." The anchorage is formed by eight shafts sunk 25 feet deep into the rock, and so secured that they cannot be drawn up without lifting the whole rock to a considerable extent. The cables, 9¼ inches in diameter, are formed of twisted iron wire, each of them consisting of 3,390 wires of No. 10. The strength of the 18 wire-rope stays is equivalent to 1,440 wires. The whole number employed are 1,500. "The compact, hard limestone, used in the masonry of the towers," is calculated to bear a "pressure of 500 ton upon every foot square." The weight of the Bridge is as follows :

Weight of Timber.....	910,130 lbs.
Wrought Iron and Suspenders...	113,120 "
Castings	44,332 "
Rails.....	66,740 "
Cables between Towers.....	534,400 "
	1,678,722 lbs.

Including weight of structure, the aggregate maximum weight to be borne amounts to 1,273 tons. (*Canadian Jour.*, August, 1854.)

So perfect is this work that I saw it stated in the newspapers a few days since, that even amidst the high winds which we have had lately, there was hardly any perceptible vibration of the Bridge.

The particulars which follow we collect from a "Statement of Accounts and Report of the Directors of the Great Western Railway," presented to Parliament, and "ordered by the Legislative Assembly to be printed, 20th October, 1854."

"The Gross Traffic for seven months, from the 1st January to the 31st July, was £150,105 11s. 8d., which, after deduct ing working expenses and all interest on bonds and borrowed money, leaves a sum of £37,479 8s. 6d. available for dividend on the share capital, from which the Directors recommend that a dividend be now declared of three per cent. up to the 31st of July, 1854, which will leave a surplus to be carried to the credit of the current half year of £457 18s. 6d. . . The Line may be said to have been practically in operation for less than six months, up to the 31st July, 1854." When the Report was given in, the number of engines received or under contract was 56. There had been received 409 cars of all sorts, and 716 were under contract—in all 1,502. The total cost of the line had been £3,457,345 4s. 2d.—a balance of £493,121 18s. 2d. standing against the Company—occasioned by the large extent to which the actual had exceeded the estimated cost of the work, in consequence partly of the great rise in the price both of material and labour, and partly of the unanticipated difficulties which had to be contended with in the construction." The cost of 24 miles of the Line from Hamilton, westward, exclusive of land, rolling stock, &c., was "£21,500 currency, per mile." Owing to the rise which has taken place in the price of land, the quantity required by the Road, including necessary additions over the original estimate, cost £175,000 currency, instead of £20,000. On January 27th, 1854, the last portion of the Road, that, to wit, from London to Windsor—110 miles—was opened. The entire length, all of which is open, is 241½ miles. By trains of all sorts there had been run up to 31st July, 1854, a mileage of 2,927,137½. The number of passengers going westward had been 87,747½—73,844 local, and 12,903½ foreign. Going westward, they had been 123,181—consisting of 81,347½ local, 13,469 emigrants,

and 28,365 foreign. Among the things carried over the road we find reported : 2,557,000 feet of timber, 53,674 barrels of flour, 30,946½ bags of wheat and corn, and 23,136½ of oats. A few days ago we saw it stated in the newspapers that flour was passing over it almost daily, on its way from the State of Iowa to New York.

[The traffic receipts of the Great Western, between January 1854 and January 1855, were—

Passengers.....	£246,567	16	2½
Mails and Sundries.....	16,964	16	11½
Freight and Live Stock....	81,291	19	4
Total.....	£344,824	12	3¾

(Mr. Widder's Pamphlet, p. 24.)

Two steamers (the America and the Canada), unsurpassed, if not unequalled on the Lakes, have recently been placed by the Great Western Company on the route between Hamilton and Oswego. It is to be hoped that the enterprise thus exhibited will prove as profitable to its authors as it is honorable both to them and the country. A few evenings ago I had the pleasure of making the trip between Hamilton and this City (Toronto) by one of these floating palaces in something less than 2½ hours. The whole time required between London and Toronto—per Railway and Steamer—is only about six hours.]

Early next year, if not sooner, the Hamilton and Toronto Road—40 miles in length—will be opened, connecting at the latter city with the Grand Trunk Line by a Station common to both, as well as to the Ontario, Simcoe and Huron Railway.

This latter line runs for the first 50 miles due north from Toronto to Lake Simcoe, skirting for a few miles the southern shore of the lake. It then traverses the country between the Simcoe Lake and the Georgian Bay (the eastern extremity of Lake Huron) to Collingwood, the distance of which from Toronto is 96 miles,—now open.

According to the Report of the Directors of this Road, pre-

sented to the Proprietors, Monday, 17th July, 1854, the cost up to that time had been £702,586 1s. 3d.—including :

Original Contract.....	£579,175	5	0
Supplementary Contract:			
1. Locomotive Stock.....	33,639	19	5
2. General Rolling Stock.....	51,661	10	8
3. Way Station Service.....	9,179	19	6
4. Terminal Depot Service.....	5,945	16	4
5. Harbor Service.....	18,229	17	4
6. Steamboat Service.....	4,753	13	0

[Mr. Cumberland's Report of 16th July, 1855, makes the total expense thus far, in the Engineer's Department, £812,022 19s. 6d.—all the contracts, with the exception of that for Collingwood harbour, being closed.]

Mr. Brunel, the Superintendent of the Road, states in his Report to the Directors, that "by connecting the Navigation of the Lakes, by spanning the Isthmus of Canada, at the narrowest point, it shortens the aggregate distance between Lake Michigan and the Atlantic Cities some 300 miles, avoids the tedious navigation of the St. Clair Flats, over which vessels are usually lighted, and saves the Tolls, expenses and delays incident to the Welland Canal, by the introduction of but 96 miles of Railway."

It results from this," Mr. Brunel continues, " that, as compared with the usual course of trade by the Lakes, the route over this road, from *New York to Chicago*, will effect a saving of three days in time; and reckoning the cost by the rates given in M'Alpine's Report" (on the Canals of the State of New York, for 1853), "and adding thereto the Welland Canal Tolls, an average tariff of $2 32c. per ton can be charged over the road, still leaving a margin of 18 cents per ton to meet the cost of transhipment, being at the rate of 25 miles per ton per mile, exclusive of the cost of loading and unloading." "As compared with the route by way of Buffalo and the Erie Canal, an equal saving in time, as above mentioned, is effected, and after charging the above named rates . . an advantage of 50

cents per ton will accrue to the owners of the freight."—In the Appendix to the above Report (A), it is stated that where the whole saving of time which can be effected between Oswego and Chicago by crossing the Peninsula of Michigan by the Southern Michigan Railway (in connection with the Welland Canal and Lake Erie) amounts only to seven hours—the one route occupying 100 hours and the other 107—the increased cost of freight will be $3 5c. per ton.

Through means of the Georgian Bay and the Straits of Mackinaw, the Ontario, Simcoe, and Huron Road is brought into easy connection at once with Lake Michigan and with Green Bay; from which latter it is connected with the Upper Mississippi River by the Fox River and Green Bay navigation, now completed, or nearly so. A Railway (the Green Bay and Minnesota Railroad) is chartered, which will connect it with St. Paul, the capital of Minnesota, by a direct line, which will reduce the distance, as compared with the present route, from 750 miles to 210. Six Light-houses are now under contract by the Government on the Georgian Bay and its northern and southern channels to Lake Huron, by which the safety of the navigation will be greatly increased. With Lake Superior and the country bordering on it, this road is brought into connection through means of the Sault Ste. Marie Canal, ready to be opened in spring, if not even now open [since opened]. Both for goods and passengers it will thus afford an advantageous means of communication with the Lake Superior country, and with Northern Michigan, Wisconsin, Iowa, and Minnesota.

Collingwood, the northern terminus of this Road on Lake Huron, will, it is stated, be reached in 22 hours from New York, and in 28 hours from Boston. "Thence the traveller can be conveyed to Milwaukie in 34 hours, though a navigation of which 200 miles is as safely sheltered as the Hudson or St. Lawrence rivers, and through which the scenery is infinitely superior to either; thus, Milwaukie can be reached in 56 hours, by a route so agreeably diversified by changes from steamboat to railroad as to afford every desirable rest and refreshment."

On the completion of the Railway from Green Bay to St. Paul, the latter place, it is stated, may be reached by the Ontario, Simcoe, and Huron Railroad in 60 hours from New York, 106 being required by other lines, even by express trains. Though requiring now three days to reach it from Chicago, it will then be brought, it is averred, within two days of Toronto. It is affirmed that the transit to and from the eastern cities will, by this route, be shortened, as compared with any other, by from three to five days.

The number of passengers carried by the Ontario, Simcoe, and Huron Railroad (though till within a few weeks a considerable portion of it remained uncompleted), between the 15th May, 1853, when 30 miles of it were opened, and the 30th June, 1854 (the days worked being 353), was 106,391 adults; 3,542 children; 8,038 carried free for construction. The amount of freight was 37,132 tons; and the earnings £29,596 16s 7½d.

Retracing our steps to the east, certain lines now claim notice, which run north and south, and which may be considered as feeders to the great arterial railway system, that runs from east to west throughout nearly the entire extent of the Province. Nearest to Montreal, and having its terminus in that city, is the Montreal and Bytown (Ottawa City) Railway. The latter is the capital of the Ottawa territory, and through it the river of the same name flows, having in its basin 80,000 miles of forest wood, from which the markets of Europe are supplied with the finest timber in the world. The total length of this line will be 120 miles, but at present only 13 miles, in the centre, are in operation, which were opened last September.

At about 25 miles west from Montreal, the Grand Trunk Railway crosses the Ottawa by a bridge, which yields only to the Victoria Bridge in extent and grandeur. Just to the west of this bridge, it is proposed that another line shall start from the north, to be carried on, in the first instance, to Bytown; with ulterior objects, one of which is said to be a nearly direct line from that city to Lake Huron.

Prescott, 120 miles from Montreal by railway distance, receives the Bytown and Prescott Railway, opened some time since, which has a length of 50 miles, with a course due north and south.

At Brockville, 13 miles west of Prescott, the Brockville and Ottawa Railway falls into the Grand Trunk. Some 30 miles of this Railway will be opened for traffic in September, 1855, that is, simultaneously with the opening of the section of the Grand Trunk (125 miles long) from Montreal to Brockville. The total length of the Brockville and Ottawa line will be 130 miles, and that company has also the idea of hereafter connecting the Ottawa with Georgian Bay, by a line taking a course some 60 or 70 miles north of the route proposed to start from Ottawa city.

The next tributary of the Grand Trunk is the Cobourg and Peterborough—140 miles west of Brockville—28 miles in length—already in operation, and having an amount of traffic, which could hardly have been anticipated by its promoters. Built as this road has been, almost exclusively by the people of Cobourg (about 5000), it reflects high credit on their spirit and vigor.

Port Hope, another very flourishing town, is about to be connected with the back country, through means of the Port Hope and Lindsay Railway, 36 miles in length—the works of which are in progress.

Proceeding west, we reach Toronto, where the Ontario, Simcoe, and Huron, already described, comes in. In regard to that city, the following language is used by a committee of gentlemen appointed to meet a deputation from the Green Bay and Minnesota Railroad :—" The railways already constructed to the mouth of the Niagara River have placed Toronto within sixteen hours travel of New York city ; the construction of the Grand Trunk Railway will place it *as near the European ports, whence immigration and commerce chiefly proceed, as the last named city is ;* while the St. Lawrence navigation places it during the open season within a cheaper distance of them."

["If," says Sir C. P. Roney, "the immense traffic combinations of which these Railways (the Grand Trunk, Great Western, and Ontario, Simcoe, and Huron) are susceptible, be carried into effect, the business in freight and passengers that will pass through that city (Toronto) will be enormous, for here will be the junction of the great main railway artery of the east with that running south-west towards Hamilton and Detroit; with the western continuation of the Grand Trunk line to Sarnia; and also with the Ontario, Simcoe, and Huron line."]

The most westerly line in Canada open for traffic having a north and south direction, is the Buffalo, Brantford, and Goderich Railway, which connects Buffalo and the State of New York with Lake Huron at Goderich, by a line of 160 miles in length, which saves, as compared with the water route of Lake Erie and the rivers Detroit and St. Clair, full 400 miles. It also, by its connection with the Great Western at Paris, places Buffalo within eight hours of Detroit, which is less than half the time it requires to go between these two cities by the magnificent steamers on Lake Erie. At Stratford, 90 miles west of Toronto, this Railway is meant to cross the Grand Trunk line, and at this point it will divide the traffic flowing from Lakes Huron and Superior, by sending that intended for the United States to Buffalo, and that for Canada and Portland over the Grand Trunk Railway. Eighty miles of this important line, from opposite Buffalo to Paris, are in operation. If the necessary funds can be obtained, the opening of the remainder will not be long in following.

The Erie and Ontario Railway, built by the enterprise of Samuel Zimmerman, Esq., by birth an American, runs for a distance of 17 miles from Chippewa, 15 miles below Buffalo, along the side of the Niagara River, passing within a stone's throw of the Falls, to the town of Niagara, situated near the mouth of the river—descending some 300 feet in a distance of four or five miles.

A line about 30 miles in length, to run from London to Port Stanley, on Lake Erie, opposite to Cleaveland, has made

some progress, and will, it is hoped, be opened in 1855 or 1856.

Three Railroads in the Eastern portion of the Province remain yet to be noticed, viz., the St. Lawrence and Champlain —the oldest of our Roads, 49 miles long, running from the south side of the St. Lawrence, opposite Montreal to Rouse's Point, on Lake Champlain, where the American boundary meets it; the Montreal and New York Railway, which extends for a length of about 30 miles on the south side of the St. Lawrence, between Whitehall and Plattsburg; and the Lachine Railway, extending for a length of nine miles between the City of Montreal and the village of Lachine, where it meets the River navigation, and also connects by ferry with the St. Lawrence and Champlain. The first of these Roads— the St. Lawrence and Champlain—connects at Rouse's Point with the Canadian and Vermont Junction Railroad, which, by the series of lines in the States of Vermont, Massachusettes and New York, leads to Boston, New York and other cities of those States on the Atlantic coast. This Road and the Montreal and New York have amalgamated, or are about to do so.

On the Roads of which we have given this rapid sketch, about £11,000,000 sterling—say $54,000,000—are stated to have been already expended. "By the close of the year 1856, Canada may fairly calculate upon having about 2,000 miles of fully equipped Railway, which will cost her about £18,000,000 sterling, or say $40,000 per mile." (*Amer. Railway Jour.*, January 1855.)

Besides the above there are several other Roads chartered, some of which are under construction; but the space we have already occupied with our Railways forbids our doing more than naming them. The Roads in question are the Rawdon and Industry—20 miles in length; the Montreal and Stanstead 106 miles; the Quebec and Trois Pistoles—145 miles; the Peterborough and Belleville—50 miles; the Peterborough and Gloucester Bay—60 miles; the Peterborough and Toronto— 75 miles; the Toronto and Guelph (constructing)—47 miles;

the Guelph and Stratford—40 miles; the Stratford and Sarnia—75 miles; the Galt Junction (completed)—13 miles; the Galt and Guelph—16 miles; and the Thorold and St. Catherines—in part under construction.

Some of these may possibly be relinquished; but the probability is that most of them will be proceeded with. It is expected that several of them will be completed at no very distant day.

Where, may we not fairly ask, is the country to be found which stands before Canada in her means of transport? Connecting together the facts adduced in this Essay in regard to the position of the St. Lawrence with respect to the European Ports, and the character of its navigation; in regard to our Canals, surpassed nowhere—if any where equalled; our splendid inland seas—with their coast of 5,000 miles and more; and our noble Railways: is not the conclusion irresistible that the tide both of commerce and travel between the seaboard and the regions of the West and North must ere long direct its course through our country? This it must necessarily have done, had Reciprocity continued to be denied us. But the fact of our having now obtained that will accelerate this result, because it will encourage our neighbours, who are too shrewed to deprive themselves of an important advantage fairly within their reach, to unite with us in making the best of the facilities with which we are so largely favoured. Already we have evidence of their disposition to do this, and we shall ere long doubtless have more.

The London *Shipping Gazette* of January 2nd, in an article headed "English Trade with America," states that a communication had been received from an intelligent correspondent at Chicago, who "points out the desirability of direct communication with Europe through the St. Lawrence, instead of, as at present, through the Erie Canal." Their correspondent informs them that a person had arrived there "on a mission from Liverpool to open business connections in the various Lake Cities, and especially in Chicago, and to arrange for a line of

propellers between that Port and Montreal." "We observe in the *Daily Press* of Chicago," says the Editor, "an advertisement requiring first-class ships for Liverpool, Glasgow, and Cork, and it seems quite clear that a direct communication with European Ports will shortly be carried on. Chicago merchants will, ere long, import their European goods direct from Europe without change of bottom or the breakage of bulk—and transport to foreign markets in the same way such products of the country as there may be a demand for, without the expense and trouble of shifting cargo. It remains to be seen whether our merchants and shipowners cannot devote some attention to this trade, and share in the profit." After a sketch of the growth of the Lake Trade, it is added, just before the passage we have quoted, "this is a field well deserving of greater attention from British merchants." (*Colonist*, Feb. 2.)

Stronger testimony to the superiority of the St. Lawrence route could not well be conceived than such a movement as that described and urged above.

There is a circumstance which is specially favourable to the immigrant from Europe—the fact, to wit, that the certainty of a return cargo from Quebec puts it in the power of the shipper to that port to bring himself, his family and his goods across the Atlantic at a more moderate rate than he can be brought to any of the American ports. From Quebec he can be conveyed for a sum comparatively small to Toronto—whence, if he choose to take up his abode among us, he can be carried cheaply and without loss of time to his destination. Should he, on the other hand, have his mind made up to try his fortune in the far West, then, according to his pleasure, or the particular locality towards which his steps are directed, he may proceed by Lewiston and Buffalo, or by the Great Western to Detroit, or by the Ontario, Simcoe and Huron to Green Bay, or Lake Superior.

In the *Globe* of to-day (Feb. 10th, 1855) it is announced that arrangements have just been made by the Directors of the Northern Railroad (Ontario, Simcoe and Huron) for the run-

ning of a line of steamers between Collingwood "and all the principal ports on Lake Michigan." Four vessels, described as being of superior character, viz., the Lady Elgin, the Keystone State, the Louisiana and the Queen City, have been chartered. Their length is from 250 to 280 feet, and they have engines enabling them to make "from 12 to 16 miles per hour. They have capacity for from 4,000 to 5,000 barrels of freight under hatches, besides their supply of fuel for a trip of 1,000 miles. They are fitted out in the best and most comfortable manner, having been first class boats in the Lake Erie passenger trade, and have saloons the whole length of the upper deck, with state-rooms for 300 passengers, besides nurseries and berths on the main deck for children and servants. They are peculiarly well adapted for a route over which emigrants are expected to pass in large numbers, from the excellent accommodation provided on the lower deck for second class passengers, rooms being fitted up so that families can be kept separate; and forward, there is still another department for steerage or third class passengers." "It is certain," it is added, "that by means of these vessels, a tri-weekly connection will be formed between Collingwood and all the principal ports on Lake Michigan—Milwaukie, Racine, and to Chicago. A tri-weekly communication will also be secured with Sault Ste. Marie, and when the Canal is opened, connections will be formed with vessels running to the mines." "Boats are now being built by the people of Green Bay, which will supply a connection with our Northern Line."

[The above line is now (4th July) in full operation, meeting the best anticipations which could reasonably have been formed of it.]

This, we conceive, is the proper place for the introduction of such particulars as we have been able to collect in regard to the transmission of goods and passengers; with the comparative distances and cost of the different routes, and the time required by them respectively. Before adducing these there are one or two things which we would premise.

In the first place, it is difficult to present any *perfectly* reliable statement in regard to the charges for conveyance of freight, inasmuch as changes take place according to circumstances. Still, we believe, the rates we are about to exhibit will be found sufficiently accurate for practical purposes. They are derived from the most available sources—to wit, statements obtained from parties engaged in the forwarding trade in Canada; the published Tariffs of the leading New York companies, kindly forwarded to me by a friend in that city; the American Railway Guide; the Report of the Ontario, Simcoe and Huron Railway; the Canada Directory; and a document, bearing date Quebec, April 1854, printed and circulated by Mr. Buchanan—Chief Emigrant Agent—for the information of emigrants.

In the second place, though the statements made in relation to time in the case of Railways may be relied on so far as respects the time occupied in actual movement, the accomplishment of very long journeys within the specified periods is hardly practicable in consequence of the fatigue necessarily attendant on keeping the trains.

The following *general Table*, founded on the statements of W. J. McAlpine, in his Report on the Canals of the State of New York, for 1853, is from the Appendix to the Report of the O. S. & H. Railroad (p. 52):

Table showing the charges for Transportation between the seaboard and the West, by the various Railroads and Water Lines:

FROM NEW YORK.

	Per ton (of 2000lbs)	Per Mile.
	Cents.	*Mills.*
Hudson River	0	7
Erie Canal	1	1
Western Lakes, short voyage	1	0
" long voyage	0	5
New York and Erie Railroad	2	4
Hudson River Railroad	3	1
New York Central Railroad	3	4
Western Roads, from Buffalo to Chicago, average	2	5

	Cents.	Mills.
FROM BOSTON TO WESTERN LAKES.		
New England Roads, from Boston to Rouse's Point...	2	7
Northern Road, Rouse's Point to Ogdensburg.....	2	0
Lake Ontario and Welland Canal.....	0	7
Western Road, Boston to Albany	2	3
FROM QUEBEC.		
St. Lawrence River and Canals.....	0	6
FROM PHILADELPHIA.		
Pensylvania Canal to Pittsburg.....	2	4
" Railroad " (estimated).....	3	5
Ohio River.....	0	8
FROM BALTIMORE.		
Baltimore and Ohio Railroad.....	3	0
FROM NEW ORLEANS.		
Mississippi River, Lower.....	0	6
" Upper.....	0	9
Ohio Canals.....	1	0
Wabash and Erie Canal.....	1	9
Illinois Canal.....	1	4
" River.....	1	2

From the above it will be seen that the only routes comparing with the St. Lawrence and its Canals as to price, are those on the Lower Mississippi and the Hudson—the former of which is the same and the latter one mill (10th part of a cent) more, to which is to be added the Long voyage on the Western Lakes, on which there is a reduction of one mill. The charges on the Hudson and on Lake Ontario and the Welland Canal are the same. Immediately on leaving the Hudson, and taking to the Erie Canal or the Railroads, the charges rise greatly, being nearly doubled (11 mills to 6) in the case of the former, and more (considerably) than trebled in the case of the latter (24 mills to 7). When the Western Lakes are reached, which, however, cannot be done without incurring the increased expense we have noticed, there is a trifling reduction on the long voyage, the charge for which is five mills.

Take Buffalo as the point to which transportation is to be effected, the cost, according to these rates, will be,—from New York to Albany (144 miles), 86 cents 4 mills; from Albany to Buffalo (364 miles, at 11 mills per mile), $4 00c. 4m.=$4 86c. 8m. in all. From Quebec the distance to Buffalo is 647 miles. At six mills per mile, this would amount to $3 88c. 2m. Throw in for the Welland Canal 3 mills additional, the cost is $3 91c. 5m. Call it $4, the difference in favour of the Quebec route is, 86 cents 8 mills—a very important matter. But there is another difference in its favour, to wit, the saving of time—which can hardly be much under five or six days. The calculation of the Commissioners of the Board of Works in their Report for 1848 (p. 3.), makes the difference in time from Buffalo to New York, as compared with Quebec, eight days. Between the voyage down and up the difference in time is about twelve hours. Consequently, according to their calculation the difference in the up voyage would be 7½ days in favour of Quebec. Allow, say, two days and a half for improvement in this respect since 1848, and 5 days still remain, supposing—what, however, is not the fact—no increase of speed on the St. Lawrence route. The Canalling on this latter route, including the Welland, amounts to only 70 miles, while on the other it is 364.

According to a statement furnished me by a gentleman connected with one of the Wharves here, freight was, last year, by mail steamers, from 25s. to 30s. currency per ton of 2,240 lbs. to Toronto or Hamilton, and from 20s. to 25s. per freight steamers. The year previous it could be had, he informed me, for 17s. 6d.

From the rates advertised as chargeable (to 15th August, 1854) for transportation by the Lines on the Erie Canal and Lakes (17 in number), I select the following particulars, by way of specimen—premising, first, that the goods are divided into two classes—heavy, and light—special rates being chargeable for certain articles which are named; and secondly, that

the rates named are binding only to Buffalo except by special contract.

From New York to Buffalo the charge for heavy goods is 33 cents; for light, 40 cents per 100lbs. The conveyance in this case is by the Hudson River and Erie Canal. Multiply by twenty, and the product will be $6.60c. for heavy goods per ton of 2,000 lbs.; for light goods, $8.

By steam on the Lakes, the charge from New York to Detrait is 47 cents per 100lbs. for heavy goods; 55 cents for light. By sailing vessels it is, for heavy goods, 40 cents; for light, 45. The cost, therefore, of transport to Detroit, by the former of these modes, amounts to $9 40c. for heavy goods; and for light to $11. By the latter mode (sailing vessels) it is $8 for heavy goods, and 9 for Light.

From New York to Milwaukie, Racine and Chicago the advertised charge is, by steam, 55 cents per 100lbs. for heavy goods; 70 for light—equivalent to $11 for the former (per ton of 2,000lbs.), and $14 for the latter. By sailing vessels it is, 45 cents for heavy goods=$9 per ton of 2000lbs; and 50=$10 for light.

Between New York and Green Bay the cost of conveyance per steamer is 65 cents=$13, for heavy goods; for light, 80 cents=$16. By sailing vessels the charge, as advertised, is 45 cents=$9 per ton, for the one class of goods, and 50 cents=$10 per ton, for the other.

The rates advertised by the New York and Erie Railroad Company's Express Line are—From New York, for goods,

	Class No. 1.	Class No. 2.	Class No. 3–per 100lbs.	
	Cents.	*Cents.*	*Cents.*	
To Buffalo.....	97	72	58	"
Suspension Bridge...	97	72	58	"
Toronto, C. W.....	122	92	78	"
Chicago	200	150	120	"

I am informed by one of the largest wholesale merchants in Toronto that during spring and summer, so soon, at least, as the season is sufficiently advanced to secure the moderate rates of insurance, the cost of bringing goods by way of Quebec is

not much over half that by way of New York or Boston. Out of the season of St. Lawrence Navigation, these places have, however, the advantage of open communication with the ocean. This Canada enjoys now, in part, through Portland; and will enjoy in full so soon as the Grand Trunk Railway is completed.

For the emigrant Quebec is unquestionably the best route, whether his intention be to settle in Canada or to pass on to the Western States; provided only he avoid coming too early in the season.

Taking the course by the Straits of Belle Isle, the passage between Liverpool, or any other port in Britain, and Quebec, is "more than 400 miles shorter," according to Mr. Andrews (p. 416) than between the same port and New York. "The navigable route between the foot of Lake Ontario and any port in Britain" is, by that route, he states, "as short as that from New York harbour to the same port." "Kingston," says Mr. Keefer (Essay, p. 67), "is as near to Liverpool, and Hamilton as near to Glasgow, as New York is to either by a sailing route. The false idea that Quebec is farther than New York from the British ports is given to persons by Mercator's projection, from the circumstance that the meridian lines are drawn parallel to each other,—a degree of longitude at the North Pole, where it is nothing, being drawn as great as at the Equator, where it is 70 miles." A thread "stretched upon a globe, from any point in the British Channel to Toledo on Lake Erie, and arranged so as to lie upon the shortest line" will, according to Mr. Keefer, "be found to run nearly throughout America, within the waters of the St. Lawrence, not deviating at any point more than 30 miles." "If the eastern end of the thread be shifted to Glasgow or the north of England, its shortest position will be found in the Straits of Belle Isle, between Newfoundland and the Labrador coast." Four hundred and seventy-five miles is given by Mr. Keefer as the amount of the difference in favour of Quebec as compared with New York. Buffalo is thus by Quebec 336 miles nearer any port in Britain, or in Europe, than by New York. Detroit, Chicago and other

western Cities are the same by the common route; while by the routes through Canada they are brought still nearer. According to the Report of the Directors of the Ontario, Simcoe and Huron Railway, that Road "shortens the aggregate distance between Lake Michigan and the Atlantic Cities some 300 miles." (p. 24.)

Let us look now for a moment or two at the comparative expense.

Between Buffalo and Detroit the first class charge by the Buffalo and Erie Railroad is $6. The charge for emigrants is not given on the bill from which I take this. From Hamilton (45 miles per steamer west of Toronto), the charge by the Great Western for first class passengers to Detroit is 25s. currency, $5; for emigrants 10s. currency, $2. By the former route the charge to Chicago for first class is $13; for emigrants $6;—while by the latter it is only $11 for first class, and $4 for emigrants—two dollars being thus saved in each case.

From Quebec to Hamilton the charge is stated by Mr. Buchanan to be 60s. for cabin on board the Royal Mail Steamers; 57s. 6d. Tate's line being taken between Quebec and Montreal. This includes meals—seven in number, equal at the common rates per meal on Board the steamers to 17s. 6d. ($3 50c.), which reduces the cost for mere conveyance to 42s. 6d. and 40s. ($8 50c., and $8). To this add 25s. ($5), as fare per Great Western to Detroit, and 55s. ($11) to Chicago; and the charge will be, without meals, equal to $13 50c., or (by Tate's line) $13 to the former place, and $19 50c. (or $19) to the latter. The ordinary fare by first class cars from New York to Detroit is $15; to Chicago, $22. On the journey there is thus in effect a saving in favour of the St. Lawrence and Great Western route of from $1 50c. or $2 to Detroit, and $2 50c. or $3 to Chicago. The advertised time on the road is only about two days (two hours less) per Railway between New York and Chicago, supposing the traveller to move on without any other break than that of passing from one car to another. But in

ordinary circumstances the attempting of such a thing is out of the question—the distance being 955 miles. Rest must be taken, in the case of families at all events; hence additional expense.

Emigrants usually travel in families—such as can afford it will take the first class cars. Suppose a family to consist of six, the difference in favour of the Quebec route—reckoning the cost of living the same in the two cases—would be $9 or $12 to Detroit, and $15 or $18 to Chicago; saying nothing of the difference in comfort by the substitution of steamer for 490 miles of the distance—which is the amount of the difference of Railway travelling in the two cases.

Though no positive announcement has yet been made by the Directors of the Ontario, Simcoe and Huron Railway, it is alleged in their Report (p. 27) that, as compared with other routes, there will be a saving of $6 per passenger, at a cost of only ten hours additional time, on the journey to Milwaukie. Conceive it to make any approach to this, it will be a matter of very great moment to the emigrant, in addition to the fact that he has to travel but a very short distance by Railway.

The deck fare from Quebec to Hamilton is stated by Mr Buchanan to be 23s. 9d. currency by the Mail Steamers; 22s. 6½d. taking Tate's Line to Montreal. Call it the first of these sums, and add 10s. ($2) for fare by Great Western to Detroit, the cost to that City will be 33s. 9d. ($6.75c.) To Chicago it will be 10s. ($2) more. The charge for emigrants by the Lines from New York I do not find mentioned. Provided it be anywhere near the same, a very important advantage still remains in favour of the St. Lawrence route—the fact, to wit, that from Quebec to the head of the water communication the baggage of emigrants is *free*. "On leaving these stations," Mr. Buchanan, on whose authority this statement is made, says, "100 lbs. is allowed to each passenger, all over that quantity will be charged."

The rates above given from Quebec are by the Mail Steamers (with the exception of the choice between these and Tate's line

as far as Montreal). On Board the Freight Steamers, which occupy a somewhat longer time (14 hours I have been informed; but say 24), Cabin passage may be obtained, I am told, to Toronto or Hamilton for 35s. ($7), with meals; Deck passage for 15s. ($3).

On board the Mail boats, as also these latter, Deck passengers may obtain meals for 1s. 3d. currency (25 cents, 1s. sterling, or a trifle over).

Passage may, of course, be taken from the home Port to Montreal, by which there will be, I suppose, the saving of the fare between that City and Quebec.

Into any comparison of charges between Boston and the West I presume it is unnecessary to enter, the shortest route between them lying, as it does, through Canada.

For the information of strangers it may be well to add the following Tables from Mr. Buchanan's Circular :

FROM MONTREAL TO WESTERN CANADA.

Daily by the Royal Mail Line Steamer, at 9 o'clock A.M., or by Railroad to Lachine, at 12 o'clock.

Distances.		Deck Fare.		Cabin Fare.	
		Sterling.	Currency.	Sterling.	Currency.
From Montreal to,	Miles.				
Cornwall	78	5s.	6s. 3d.	11s.	13s. 9d.
Prescott	127	6s.	7s. 6d.	14s.	17s. 6d.
Brockville	139				
Kingston	189	8s.	10s.	20s.	25s.
Cobourg	292				
Port Hope	298	12s.	15s.	28s.	35s.
Bond Head	313				
Darlington	317				
Whitby	337	14s.	17s. 6d.	34s.	42s. 6d.
Toronto	367				
Hamilton	410	16s.	20s.	36s.	45s.

I am informed that the number of steamers in the Mail line between Quebec and Hamilton is nine, and that the Freight Steamers are somewhere about twenty.

Passengers by the Mail line tranship at Kingston to the Lake steamers, and at Toronto for Buffalo :

FROM HAMILTON TO THE WESTERN STATES, BY THE GREAT WESTERN RAILROAD.

Distance.		Emigrant Train.		First Class Train.	
		Sterling.	Currency.	Sterling.	Currency.
From Hamilton to,	Miles.				
Dundas	6	6d.	7½d.	1s.	1s. 3d.
Flamboro'	9	.....	.....	.....	.....
Paris	20	2s.	2s. 6d.	3s. 8d.	4s. 6d.
Woodstock	48	3s.	3s. 9d.	5s.	6s. 3d.
Ingersoll	47	3s. 6d.	4s. 4½d.	7s.	8s. 9d.
London	76	4s. 9d.	6s. 0d.	9s.	11s. 3d.
Eckford	96	6s.	7s. 6d.	14s.	17s. 6d.
Chatham	140	7s.	8s. 9d.	.....	.....
Windsor / Detroit, Michi'n.	186	8s.	10s.	20s.	25s. 0d.
Chicago, Illinois		16s.	20s.	44s.	55s. 0d.

Trains leave Hamilton daily for Detroit, connecting at that City with the Michigan Central Railroad for Chicago.

Steamers leave Chicago daily for Milwaukie, and all other Ports on Lake Michigan.

Emigrants on arriving at Chicago, if proceeding further will, on application to Mr. H. J. Spalding, Agent of the Michigan Central Railroad Company, receive correct advice and direction as to route.

OTTAWA RIVER AND RIDEAU CANAL.

From Montreal to Bytown and places on the Rideau Canal, by Steam every Evening,—by Robertson, Jones & Co.'s Line.

Distance.		Deck Passengers.		Cabin Passengers.	
		Sterling.	Currency.	Sterling.	Currency.
From Montreal to,	Miles.				
Carillon	54				
Grenville	66	2s.	2s. 6d.		
L'Orignal	73	3s.	3s. 9d.		
Bytown (Ottawa City)	129	3s.	3s. 9d.		
Kemptville	157	4s.	5s. 0d.		
Merrickville (Rideau Canal)	175				
Smith's Falls (Rideau Canal)					
Oliver's Ferry (Rideau Canal)	199	6s.	7s. 6d.		
Isthmus (Rideau Canal)	216				
Jones' Falls (Rideau Canal)	226				
Kingston (Rideau Canal)	258				

Passengers proceeding to Perth, Lanark, or any of the adjoining settlements, should land at Oliver's Ferry, seven miles from Perth.

Passengers wishing to proceed to the Eastern parts of the United States—Maine, Newhampshire, Massachusetts, Connecticut, Vermont, New York and Pennsylvania—take the Champlain and St. Lawrence Railway. To New Brunswick, the best and most expeditious route is by the St. Lawrence Railroad, from Montreal to Portland—thence by Steamer, which leaves for St. John's, N. B., every Monday and Wednesday evening at eight o'clock.

"Steamers leave Kingston daily for the Bay of Quinté and the River Trent, calling at Picton, Adolphustown, Belleville, and other landing places in the Bay."

"From Toronto Steamers leave daily for Port Credit, 15 miles; Oakville, 25 miles; Wellington Square, 37 miles; Hamilton, 43 miles; also Port Dalhousie on the entrance of the Welland Canal, Niagara, Queenston and Lewiston—Passage 3s. 9d (currency, Deck).

Throughout these passages, children under 12 years of age are charged half-price, and those under 3 years are free.

The gold Sovereign is at present worth 24s. 4d. currency, the English Shilling 1s. 3d.; and the English Crown-piece 6s. 1d."

Emigrants immediately on their arrival at Quebec, should proceed to the Office of the Chief Agent for Emigrants [Mr. Buchanan], where persons desirous of proceeding to any part of Canada will recive every information relative to the lands open for settlement, routes, distances, and expenses of conveyance; where also Labourers, Artizans, or Mechanics, will be furnished, on application, with the best directions in respect to employment, the places at which it is to be had, and the rates of wages.

"Emigrants are entitled by law to remain on board the Ship 48 hours after arrival; nor can they be deprived of any of their usual accommodations and berthing during that period, and the Master of the Ship is bound to disembark them and their baggage, *free of expense*, at the usual landing-place, and at reasonable hours"—viz., not earlier than six o'clock in the morning, or later than four in the afternoon.

From Mr. A. Conlan (Sub-Agent), at Montreal, and Mr. A. B. Hawke (Chief Agent for Western Canada), at Toronto, information may also be obtained.

"Emigrants should remain about the Towns as short a time as possible after arrival."

"Emigrants proceeding to the EASTERN TOWNSHIPS, especially the populous and flourishing Villages, DRUMMONDVILLE, KINGSEY, SHIPTON, and MELBOURNE, and the County-Town of SHERBROOKE, will proceed by the regular Steamer to Montreal, and thence by the St. Lawrence and Atlantic Railroad from Longueuil to Sherbrooke, 103 miles."

BYTOWN AND THE OTTAWA RIVER SETTLEMENT.

"Route from Montreal to Bytown (Ottawa City), by Steamer daily, 129 miles; Bytown (O. C.) to Aylmer, by land, 9 miles; Aylmer to Sand Point, by steamer, 45 miles; Sand Point to Castleford, by steamer, 8 miles; Castleford to Portage-du-Fort, 9 miles; Portage-du-Fort to Pembroke, by land and water, 33 miles."

PART THIRD.

SOCIAL.

The Civil Government of Canada is exercised by a Governor General appointed by her Majesty as her Representative, aided by a Council composed of Heads of Departments; in conjunction with two Houses of Parliament,—a Legislative Assembly, to wit, consisting of 130 Members—one-half for Lower and the other half for Upper Canada—elected by the people,—and a Legislative Council, which must number not fewer than twenty persons, (the number now actually constituting it being 33,) appointed for life by the Crown.

Speaking generally, these two Bodies possess and exercise the powers possessed and exercised by the two Houses of the British Parliament, by whose rules their proceedings are governed in cases not otherwise provided for, the Assembly taking exclusively, like the British House of Commons, the initiative in the case of money-bills.

For its action the Executive Council by which the Governor General is advised, is responsible to the House of Assembly; holding office only so long as it retains the confidence of that Body.

To qualify a candidate for election to the House of Assembly, it is required that he be a British subject by birth or

naturalization, of twenty-one years of age, and that he possess freehold property of the value of £500 sterling, without incumbrance. The same qualification is exacted in the case of the Legislative Council, with the exception of the freehold possession. For the purpose of Representation the country is divided into 125 Electoral Districts, 62 in Lower and 63 in Upper Canada, whose limits are defined by Act of Parliament.

The right of voting *at Elections for Cities and Towns*, is extended by law to "every male person entered on the then last Assessment Roll, revised, corrected, and in force in any City or Town entitled to send a member or members to the Legislative Assembly of the Province, as the owner or as the tenant or occupant of real property therein or in the liberties thereof, as bounded for Municipal purposes, of the assessed yearly value of seven pounds and ten shillings or upwards, or who is entered on such last corrected Assessment Roll of any Township, Parish or place, as the owner, tenant or occupant of any real property which is within the limits of any City or Town, for the purposes of the Representation, but not for Municipal purposes, of the assessed value of fifty pounds at least, or the yearly value of five pounds or upwards;" and at *Elections for Counties and Ridings*, to "every male person entered on the then last Assessment Roll, revised, corrected, and in force in any Parish, Township, Town, Village or place, not being within any City or Town entitled to send a member or members to the Legislative Assembly of the Province, as the owner, tenant or occupant of real property of the assessed actual value of fifty pounds or upwards, or the yearly assessed value of five pounds or upwards."

Partners in business, and joint tenants or occupants of real property possess each the privilege of voting on it, provided the share of each in it be such as would have given him the right of voting supposing it entered on the Assessment Roll in his own name.

In the case of Upper Canada, alphabetical Lists of parties entitled to vote are ordered by the Act to be made out by the

Clerk of each Municipality from the revised and corrected Assessment Roll, of which he must deliver an attested duplicate to the Registrar of the County within which the Municipality is situated, on or before the first day of September in each year. Those only whose names are on such List are allowed to vote, and the only question which can be raised as to the qualification of any party claiming to vote on the List, is whether he be really the party named in the List.

The required Lists are to be made out in Lower Canada, with the exception of the Cities of Quebec and Montreal, by the Secretary and Treasurer of the Municipality, and must distinguish those qualified as tenants or occupants.

For the guidance of the Deputy Returning Officer, the law requires that he be furnished with a copy of the certified List of voters for the Electoral Division or Ward for which he may have been appointed to act.

The period prescribed for the duration of Parliament is four years, but the Governor General, or party exercising the Government, may dissolve it sooner should he think proper to do so. Members have an allowance made to them of £1 per day [since made £1 10s.] during the sitting of the House, with 6d. per mile as travelling expenses.

Acts passed by the two Houses require the assent of the Representative of her Majesty to give them the force of Law, —such assent to be formally given in the presence of the members of both Houses.

Her Majesty may at any time within two years express her disapproval of the Laws thus passed, in which case they cease to have effect.

In the case of Bills reserved by the Representative of the Sovereign for the consideration of her Majesty (a right which he may exercise whenever he deems it called for), the Royal Assent may be given at any time within two years, the Bill in question deriving from that assent the force of law.

By the Constitutional Act "Bills passed on certain enumerated subjects, respecting religion and its establishment and

support, are required to be reserved, and also to be laid before both Houses of the British Parliament, before being assented to by the Queen; and if either of the said Houses address her Majesty against them, she is restrained from giving her assent." (Gourlay, Vol. I., p. 202.)

The Sessions of Parliament, which must be held annually, are invariably opened by her Majesty's Representative, who may at his pleasure prorogue them from time to time for a period not exceeding forty days, subject to the condition above named as to annual coming together.

By an Act passed in the 18th year of George III. (1778), and recited and renewed in the Constitutional Act, the British Government renounce all right of Taxation over Canada, except in the case of such duties as may be required for the regulation of commerce, which duties it places entirely at her disposal. The faith thus pledged has hitherto been preserved inviolable; nor is there room for apprehension that it "will ever be violated." (Gourlay.)

The principle now acted upon by the British Government, and distinctly announced as that by which its procedure is regulated, is to leave Canada the unrestricted right of managing her own affairs as she may herself judge best. Under the influence of this principle she is prospering, and becoming every year, it might almost be said every day, more firmly bound, because attached more affectionately, to the mother country.

For the carrying out of the Laws enacted by the Parliament the following Courts exist in Lower and Upper Canada respectively:

"Lower Canada is divided into five Districts or Shrievalties, possessing distinct Judicatories. In each of the superior districts of Montreal and Quebec, there is established a Court of Queen's Bench, possessing independent and superior civil and criminal jurisdiction. The Judges are, at Quebec, the Chief Justice of Canada, and three Puisne Judges; and at Montreal, the Chief Justice of Montreal, and three Puisne Judges. There is also a Court of Appeal in each of those Districts.

There are, besides, inferior Judicatories within each of them. In the Districts of Three Rivers, St. Francis, and Gaspé, there are also independent Judicatories established. The Court of Vice Admiralty sits at Quebec." There are Courts of Bankruptcy, presided over in the Districts of Montreal and Quebec by the Circuit Judges, and in the other Districts by Commissioners appointed by the Governor General.

Terms or Sessions of the Court of Queen's Bench, in inferior Term, for the cognizance of all crimes and criminal offences, and of all suits or actions of a civil nature, are held at stated periods yearly, in each of the Districts of Quebec, Montreal, Three Rivers, and St. Francis.

The Courts of Queen's Bench, sitting in inferior Term, in the several Districts of Quebec, Montreal, Three Rivers, and St. Francis, have cognizance of, and try and determine in a summary manner, civil cases, in which the matter in dispute does not exceed £20 currency. The Circuit Courts are held every year, in the several Counties, in places appointed by the Judicature Act; each Circuit, within its limits, having concurrent Jurisdiction with the Court of Queen's Bench for the same District, as in inferior Term. (See Judicature Act, 7th Vic., cap. 16.)

There is a special Judicature Act for the District of Gaspé (7th Vic., cap. 16). The Courts are held by the District Judges in their respective Counties, and are similar to those in the other Districts.

There are also Tribunals established in Lower Canada for the summary trial of small causes, affording an easy and expeditious mode of recovering petty debts. These are called Commissioners' Courts, formed under the authority of the Act 7th Vic., cap. 19, and are held in the several Parishes or Townships, upon petition of the inhabitants to the Governor General to appoint Commissioners. The Circuit Judges in Quebec and Montreal are, *ex officio*, Commissioners of these Courts in their respective Districts. The Jurisdiction of the Courts is limited to six pounds five shillings currency. For the Cities

and Parishes of Quebec and Montreal, the Courts are held weekly, every Monday, not being a holiday, and if so, then on the following day; and for all other places they are held monthly, on the first Monday of every month, not being a holiday, and if so, then on the following day—the Commissioners having power to adjourn to any other days they may deem necessary, for hearing witnesses and determining suits. The Act makes provision in detail for the mode of procedure as in the Commissioners' Courts." (Scobie's Almanac for 1849, pp. 57, 58.)

The Laws in force in Lower Canada are: 1st. The Acts of the British Parliament which extend to the Colonies: 2d. Capitulations and Treaties: 3rd. The Laws and Customs of Canada, founded principally on the Jurisprudence of the Parliament of Paris, as it stood in 1663, the edicts of the French Kings, and their Colonial authorities, and the Roman Civil Law: 4th. The Criminal Law of England, as it stood in 1774, and as explained by subsequent statutes: 5th. The Ordinances of the Governor and Council, established by the Act of the above year: 6th. The Acts of the Provincial Legislature since 1792." (Montgomery Martin's British America, p. 120, 121.)

The prevalence in Europe of the Feudal Tenure at the time when the French took possession of Canada, naturally led to its introduction here. The King of France as Feudal Lord, granted to nobles and respectable families, or to officers of the army, large quantities of land,—termed Seigniories,—which were held by their possessors, who bore the name of Seigniors, immediately from the Sovereign, *en fief*, or *roture*, on condition of rendering fealty and homage on accession to Seignorial property, and the payment of certain dues on transfers by sale, gift, or otherwise than by hereditary succession. Under this tenure nearly eleven millions of acres are held, smaller proprietors holding of the Seigniors.

Over seven millions of acres are held in Lower Canada partly on what is called "Franc aleu noble,"—which is a *fief*, or freehold estate, exempt from Seignorial dues and without Seig-

norial rights, and acknowledging no lord but the Sovereign, and partly—chiefly in the Eastern Townships—on free and common Soccage.

"The succession to *fiefs* is different from that of property held *en roture* or by *villainage*. The eldest son, by right, takes the Chateau, and the yard adjoining it; an *arpent* of the garden which joins the Manor-house, and the mills, ovens, or presses, within the Seigniory, belong to him; but the profit arising from these is to be divided among the other heirs. Females have no precedence of right, and when there are only daughters, the *fief* is equally divided between them. When there are only two sons, the eldest takes two-thirds of the lands, besides the Chateau, mill, &c., and the younger one-third. When there are several sons, the elder claims half the lands, and the rest have the other half divided among them. Property, according to the laws of Canada, is either *propre*, that is held by descent, or *acquits*, which expresses being acquired by industry or other means. *Communauté du bien* is partnership in property by marriage; for the wife, by this law, becomes an equal partner in whatever the husband possessed before, and acquires, after marriage,—and the husband is placed in the same position in respect to the wife's dowry." The above law involves some inconveniences and is open to some abuse, as the children may, if they please, in the event of the wife's dying before the husband, claim half the property as heirs of their mother.

"The *dot* or dowry, is the property which the wife puts in to the *Communauté du bien:* movable or unmovable property falling to her by descent, is a *propre*, and does not merge in the *Communauté*. Dower in Canada is either customary or stipulate. The first consists of half the property which the husband was possessed of at the time of marriage, and half of all the property which he may inherit or acquire—of this the wife has the use for life, and the children may claim it at her death. If they be not of age, the wife's relations, as the guardians of the children, can take it out of the father's hands,

and may compel him to sell his property to make a division. Stipulated dower is a portion which the husband gives instead of the customary dower.

The Canadian farms are remarkable for the small breadth of the farm on the bank of the river, and its great depth inland; the latter being often in proportion to the former as 60 to 1, namely, half an arpent broad in front of the St. Lawrence, or other river, and 30 arpents in depth." (Montgomery Martin.)

The Courts of Upper Canada are as follow:

1. Superior Courts.

These are the Courts of Queen's Bench and Common Pleas, each presided over by a Chief Justice and two Puisne Judges; the Court of Chancery, presided over by a Chancellor and two Vice-Chancellors (or Masters); and the Court of Error and Appeal, composed of the Judges of the Courts of Queen's Bench, Common Pleas, and Chancery. These Courts all sit at Osgood Hall, Toronto.

The Judges of the above Courts are appointed by the Crown from Barristers of at least ten years standing, and hold their offices during good behaviour, being removable upon an address of both houses of the Provincial Parliament, subject to appeal to the Queen in Privy Council.

2. Courts of Probate and Surrogate.

3. County Courts.

These are presided over by a resident Judge in each County. Their jurisdiction extends to all causes relating to debt, covenant, or contract, to the amount of £50; and in cases of debt or contract, where the amount is ascertained by the signature of the defendant, to £100; and also in all matters of tort relating to personal chattels, where the damages shall not exceed £30; and where the title of land shall not be brought in question. The plaintiff at his option may bring these suits in the Courts of Queen's Bench or Common Pleas, but County Courts' costs will only be allowed.

4. Division Courts.

The jurisdiction of these extends to cases of debt or account, or breach of contract or covenant, or money demand, whether payable in money or otherwise, where the amount or balance claimed does not exceed £25, and all torts to personal chattels to the amount of £10. Servants under age may sue for wages in this court. Attachments may issue against goods and chattels of absconding or concealed debtors, going from one county to another in Upper, or to Lower Canada, or leaving the Province, for any sum not exceeding £25, nor less than twenty shillings. Juries are granted in certain cases. The Courts are held once in two months in each division, or oftener, at the discretion of the Judge.

5. Insolvent Debtors' Court.

The County Judge in each county presides in this Court for the relief of insolvent debtors.

6. Quarter Sessions.

Of this Court the County Judge in each county is *Chairman*, who, with one or more Justices of the Peace, holds a Court of Quarter Session in his county four times a year, for trial by Jury, in cases of larceny, misdemeanour, and other minor offences.

7. Heir and Devisee Court.

Of this Court, which holds its sittings at Toronto, the Judges of the Court of Queen's Bench, Chancery and Common Pleas, and such other persons as may be appointed by Commission under the Great Seal, are Commissioners. Their duties are to determine claims to lands in Upper Canada, for which no patent has issued from the Crown, in favour of the proper claimants, whether as heirs, devisees, or assignees. (Scobie's Almanacs for 1850 and 1852.)

In addition to the above Courts, there is a Provincial Court of Appeal, consisting of the Governor-General, who is President, *ex officio*, the Chief Justices of the Province, and the members of the Executive. Five of the above parties, including

the President, form a quorum, competent to hear and determine Appeals from judgment pronounced in the Court of Queen's Bench in civil matters. Where the matter in dispute exceeds £500 in value, an appeal lies to the Queen in Privy Council; if below that sum, the decision is final. (M. Mart, p. 121.)

The Law of Upper Canada is that of England, as modified or supplemented by the statutes of the Province. The titles by which lands are held are free and common soccage and patents from the Crown.

By an Act passed in 1851 (14th and 15th Vic., cap. 6), the Law of Primogeniture was abolished in Upper Canada, and real estate possessed in fee simple by parties dying intestate commanded to be divided according to the relative claims of survivors or their heirs on the deceased. Such property is ordered to pass—

Firstly—To the Lineal Descendants of the Intestate, and those claiming by or under them, per *stirpes;*
Secondly—To his Father;
Thirdly—To his Mother; and
Fourthly—To his Collateral Relatives.

Where the relationship is equal, the share is to be equal. Children thus inherit equally. So also brothers and sisters share equally in the property of a brother or sister who dies intestate and without issue. The descendants of a deceased child, brother, sister, or other relative inherit the portion which would have fallen to their parent, provided he or she had been living. Provision is made by the Act for the sale of the estate of the intestate with a view to its division, when applied for by any of the parties interested.

MUNICIPAL INTSITUTIONS.

Canada possesses a very complete Municipal system, which is working admirably.

The Municipalities of Upper Canada are of six distinct classes, viz.:

1. Townships having "one hundred or more resident freeholders or householders on the Collector's Roll."

Townships containing a smaller number of resident freeholders or householders than a hundred are connected as Junior Townships with Townships adjacent. Provided such connection involve special inconvenience, Junior Townships having 50 resident freeholders or householders, may be separated and constituted a distinct municipality, should it be required by two-thirds of these. Townships may, at the pleasure of the County Council, be divided into rural wards, the distribution of freeholders and householders in such wards respectively being as nearly as possible equal, and regard being had at the same time to the convenience of the parties.

2. Counties—and Unions of Counties.

3. Police Villages.

These may be constituted, at the discretion of the County Councils, where any number of the inhabitants of an incorporated Village unite in petitioning for the privilege.

4. Incorporated Villages.

These are constituted by proclamation of the Governor General, on petition of not less than 100 of the inhabitants of such Police Villages, Hamlets, or places as shall be shown by the Census to have 1,000 persons living in such convenient proximity to each other as may enable them advantageously to be incorporated.

5. Towns.

These consist of Incorporated Villages proclaimed by the Governor General, on petition of the Municipality, so soon as they are shown by census to have 3,000 inhabitants.

6. Cities.

This rank is obtained by proclamation of the Governor General, on petition of the Town Council, when Incorporated

Towns come, as shown by the census, to have a population of 10,000. Each Incorporated City constitutes a County in itself for certain purposes.

With the exception of the Police Villages, the Act confers on each of these Municipalities corporate powers, to be exercised in the name and for the benefit of the Municipality—distributing among them the regulation of the entire local affairs of the County, the powers of each becoming more extended as it rises from the Township to the City or County.

By way of illustration we add a few items exhibiting the descriptions of powers committed to them respectively, premising that they all enjoy the right of framing such by-laws as may be necessary for the carrying out of the purposes of their constitution.

To the Townships belong the right, among other things, of purchasing such property as may be necessary for the uses of the Town, and of disposing of it when no longer required; the erection of Town Hall, School-houses, Public Pound for the reception of cattle which may be straying or giving annoyance; the appointment of Assessors, Collectors, Pound-keepers, Fence-viewers, and other Township officers—election of Reeve included; for regulating the duties and determining the remuneration of Township officers; for erection of drains, &c., the opening, constructing, repairing, and altering of roads, sidewalks and so forth; making provisions in regard to orchards, protection of timber, stone, &c., with sale of timber; regulating inns, taverns, victualling houses, and such like; the granting of licences, in certain cases, to houses of public entertainment; granting money to County Council to aid in the improvement of roads, taking stock in Road or Bridge Companies; restraining and regulating the running at large of certain animals, imposing dog-tax, regulating public exhibitions, establishment of boundary lines, compounding for statute labour, borrowing money, raising and levying money, levying poor-rates—with other things analogous.

County Councils are charged with the keeping and repairing of the Shire Hall, the making and regulating of county roads, the purchase of property, &c., erection of buildings for county purposes, the erection and assistance of county grammar-schools, making provision for the expenses of students attending the University of Toronto where held to be needed—with the establishment of Fellowships, Scholarships, exhibitions and prizes therein—granting loans to Towns, Townships, or Villages within the County, granting licences to Road and Bridge Companies, and taking stock in them, borrowing and levying money, and imposing Assessment for certain purposes under specified restrictions.

Police Villages are authorised to make police regulations for the preservation of buildings from fire, with matters of a similar sort.

Incorporated Villages are empowered, besides other things, to open roads; fix boundary lines of highways; grant money to Counties by loan or otherwise; regulate markets, weights, measures, vehicles, and harbours; restrain monopoly, sale of unwholesome meats; appoint harbour dues; enforce the due observance of the Sabbath; prevent vice, drunkenness, swearing, immorality, indecency, and so forth; suppress tippling houses, with other houses of improper character, gambling, vagraney, and such like; abate nuisances; establish lock-up houses; erect public fountains, wells, and other conveniences; lay out cemeteries; borrow and levy money, &c.

Besides the powers belonging to Incorporated Villages, Incorporated Towns may establish police, erect and regulate workhouse and house of correction; regulate the erection of buildings; purchase land for Industrial Farm; light Town with gas; assess property for special improvements, and general expenses; borrow and levy moneys; grant powers to Gas and Water Companies and subscribe for stock in them; raise money to pay for such stock by rates and debentures; and exercise other privileges of a kindred nature.

By Cities the powers enjoyed by the smaller Municipalities

are of course all possessed, with such additional ones—among them that of having a Recorder's Court—as their well-being may demand.

Township Municipalities and those of Incorporated Villages, consist in each case of five Councillors—each ward returning one where such Townships or Villages are divided into wards: Police Villages have three Police Trustees; Towns have three Councillors for each ward; Cities two Aldermen and two Councillors for each ward. The County Municipality is composed of the Reeves and Deputy Reeves of the several Townships, Villages, and Towns within the County. Townships, Villages and Towns with 500 freeholders or householders on the Assessment Roll are entitled to elect a Deputy Reeve, as well as a Reeve, which gives them a double voice in the County Municipality.

The qualifications for voting in the election of Municipal Councillors, which takes place annually, are—

For Townships and Police Villages, the being resident freeholders or householders, entered on the Roll for rateable real property, in their own right or that of their wives, as proprietors or tenants; for Incorporated Villages, the being on the Roll, as above described, for real property of the value of £3 or more per annum. For Towns the amount is £5 per annum; and for Cities £8. The Township, Village and Town Municipalities constitute the electors for the County Councils, which consist, as before mentioned, of the united Reeves and Deputy Reeves. These various Municipalities elect their own officers, the County Warden being chosen by the County Council.

The qualifications necessary to the being eligible as Councillors are:

For Township Councillors the being rated on the Roll, for real property in his own right or that of his wife,—as proprietor, to the amount of £100, or tenant, of £200. A Police Trustee must be rated, as above, for £100; a Village Councillor,—if a freeholder, for £10 per annum, if a householder, for £20; a Town-Councillor for double that of a Village Coun-

cillor, viz., £20 as a freeholder, and £40 as a householder. The sum required in the case of a City Councillor is the same as the last; but an Alderman must be rated for twice the amount—to wit, for £40 as a freeholder, or £80 as a householder.

The elections take place in the case of all the Municipalities, which must number somewhere about 500, (in Upper Canada,) on the first Monday in January of each year.

Necessarily brief and imperfect as the above sketch is, it will be seen from it that the people in Canada West have the management of their more general affairs in their own hands. And they are managing them well, as the improvements of every sort which are being carried on over the whole country, many of them at a large expense, most abundantly testify.

The quiet with which the above machinery is working—the introduction of which we owe to the Hon. Robert Baldwin—and the measure in which it is contributing to educate the people for the exercise of privileges and the performance of duties of a still higher order, call for notice, at once admiring and grateful.

[The Municipal system of Lower Canada having been substantially assimilated, by a Bill passed since the above was written, to that of Upper Canada, we omit the separate notice of it given in the Essay as sent down to Quebec—which is deemed to be now unnecessary.]

EDUCATIONAL PROVISIONS AND CONDITION OF CANADA.

The first Common School Act for Upper Canada bears date 1st April, 1816, though so early as 1807—just fifteen years after the separation of the Province from that of Quebec—an appropriation of £100 per annum was made to the Teacher of one school in each of the eight districts into which it was divided. (Gourlay, Vol. I., pp. 244—q. 46.)

By the Act in question (which may be seen in Gourlay, Vol. II., p. 277—q. 83), the sum of six thousand pounds per annum was appropriated, for four years, to the support of Common Schools—to be distributed as follows: Midland District, £1,000; Eastern, £800; Home, London, Johnston, Gore, Niagara and Western, £600 each; Newcastle, £400; Ottawa, £200.

The inhabitants were authorised to meet on the first of June in each year to make arrangements for the establishment and management of Schools, three Trustees being to be chosen in any Town, Township, Village, or place, so soon as a suitable School-house should be erected or procured, twenty Scholars secured, and provision made in part for a Teacher's support.

The Trustees were empowered to examine and engage Teachers, who must be British subjects by birth or naturalization; and generally to manage the Schools, subject to a Board of five persons to be appointed in each District by the Crown. It was required that reports should be presented annually by the Trustees to the Boards, which should report annually to the Governor, who should cause said reports to be laid before Parliament. To each District Board liberty was given to expend, out of the sum placed at its disposal, £100 in the purchase of books for the Schools. The allowance to Teachers, out of the above funds, was limited to £25 per annum.

In substance the above Act was borrowed from the State of New York. Considering the circumstances of the country the grant was liberal, as was also the spirit of the Act, which left the working of the system with the people—under certain restrictions of a wholesome character.

The present Common School system of Upper Canada had its commencement in the passing of a law in 1841—introduced by Hon. S. B. Harrison—embodying the principle of granting money to each county on condition of its raising an equal amount by local assessment. (Dr. Ryerson's Report for 1852, pp. 267, 268.)

School-Acts, amending and improving that of 1841, were

passed in 1843 and 1846—the former being introduced by the Hon. Francis Hincks, the latter by the Hon. W. H. Draper,—then Attorney-General, now one of the Judges of the Court of Queen's Bench. The Hon. J. H. Cameron (then Solicitor General) introduced in 1849 an Act, which was passed, establishing a system of Schools in Cities and Incorporated Towns. In 1850 these two Acts were incorporated in one introduced by Hon. Francis (then Inspector General) Hincks; which further embodied such improvements as "experience had suggested and the progress of the system required."

It is to the honour of the political parties in whose hands the Government has been placed that, in whatever else they may have differed, one spirit appears to have animated them in regard to this—one of the most momentous of the country's interests.

In 1844, the Rev. Dr. Ryerson—to whose intelligence and zeal we owe so much both of what is best in our School-system and of the efficiency of its working—was appointed Superintendent of Schools for Canada West; an office which we trust he will long retain, enjoying in it the privilege of rendering to his loved native land services still more valuable than those for which she is already so deeply indebted to him.

The School system of Upper Canada copies, in part, that of New York State in its machinery, and that of Massachusetts in its principle of support; while it makes use, for purposes of instruction, of the Irish National School-Books, and follows Germany in its Normal-School arrangements.

Christianity forms,—as of right it ought to do among a people believing it to be from heaven,—the basis of the system, in the working out of which the clergy of all denominations are, to a large extent, combined with the people, at the same time that sectarianism is carefully avoided; the right of the parent to direct the religious instruction of his child respected, and the master protected against being called on to teach that of which he disapproves.

Each Township is divided by its Municipal Council into School sections, the affairs of each of which are managed by three Trustees, who hold office for three years—one being elected annually by the freeholders and householders of the section. At the pleasure of the Trustees, males and females may be received into the same School, or separate Schools be provided for each sex. The Trustees, who are required to account annually to their constituents, and to make an annual report to the Local Superintendent, determine the sums necessary for the furnishing of the Schools, and appoint the salaries of the Teachers.

To the Municipal Council it belongs to impose "assessments for the erection of School-houses, or for any other School purposes desired by the inhabitants of School sections through their Trustees. The inhabitants of each School section decide as to the manner in which they will support their School according to the estimates and engagements made by the Trustees, whether by voluntary subscription, by a monthly rate-bill of not more than one shilling and three-pence per child on parents sending to the Schools, or by rates on the property of all according to its assessed value, and opening the Schools to the children of all without exception. The latter mode is likely to supersede both the others; but its existence and operation, in connection with each School, depend upon the annual decision of the inhabitants of each School section at a public meeting called for that purpose." (Report for 1852, pp. 269, 270.)

To entitle it to share in the Public Grant, a School must be kept open, under an authorised Teacher, for at least six months in the year. A certificate of qualification from the County Board must be held by the Teacher, who is required also to be of good moral character. Quarterly examinations of each School are enjoined.

For the purpose of securing efficient working Superintendents are appointed by the County Councils—for single Townships or Unions of Townships at their pleasure—whose duty it

is to visit each School twice a-year, and to deliver annually one public lecture on education in each School section under their charge; to apportion the money to the sections, giving cheques (on the order of the Trustees) on the County-Treasurer or Sub-Treasurer; to assist in the examination of Teachers and the deciding of disputes; and to report annually to the Chief Superintendent. For their services these Superintendents—of whom Dr. Ryerson's Report for 1852 gives the names of 272, 96 of them being clergymen, and 12 doctors of medicine—are entitled to £1 at least for each School under their charge.

Clergymen recognized by law, Judges, Members of the Legislature, Magistrates, members of County Councils, and Aldermen are visiters *ex officio*. The law authorises the School visiters of any Municipality to meet (on the call of two of their number), to devise measures for efficient visitation, and for the establishment of School Libraries.

Each County has a Board of Public Instruction—composed of the Local Superintendents and the Trustees of the Grammar Schools of the County, by which "the Teachers are examined, and arranged into three classes according to a programme of examination prepared and prescribed by the Council of Public Instruction for Upper Canada."

"These County Boards consist largely of the clergy of the different religious persuasions, associated with some of the most intelligent laymen in each County."

A sum at least equal to that received by each County out of the Public grant, must be raised by the Municipal Council towards the salaries of Teachers. These Councils appoint the Sub-Treasurers of the School Fund—as well as the Local Superintendents—and determine their salaries. Provision is likewise made by them for the security of the sums appropriated, and for the prompt payment of the Teachers. County and Township Councils may raise such sums as they deem proper for Public School Libraries, (subject to the provisions of the law,) towards the establishment and support of which a Parliamentary

grant has been made to be expended on the same conditions as the School Fund.

For the general management of the Schools, Cities and Towns have School Boards—consisting of two Trustees, chosen by the people, and holding office for two years, one retiring annually, but being at the same time eligible for re-election. Incorporated Villages, not divided into wards, have six Trustees, two of whom retire annually. These Boards determine the number and description of Schools to be supported, appoint Teachers and Superintendents, and fix the rates for the necessary expenses, which the County Councils are required to raise as asked.

The whole School system is presided over by a Council of Public Instruction and Chief Superintendent of Schools, who is *ex officio* a member of the Council—both appointed by the Crown. This Council manages the Normal and Model Schools, "recommends the Text-books for the Schools and books for the School Libraries, and makes the regulations for the organization, government, and discipline of Common Schools, the examination and classification of Teachers, and the establishment and care of School Libraries through Upper Canada."

The Chief Superintendent—who is, as above noticed, "*ex-officio* a member of the Council, provides accommodation for its meetings—apportions the School Fund to the several Municipalities throughout Upper Canada, prepares the general School regulations, and submits them, as well as the Text and Library Books, to the consideration of the Council, prepares the forms of reports and modes of all School proceedings under the Act, and gives instructions for conducting them, as well as for holding Teachers Institutes; takes the general superintendence of the Normal School; provides facilities for procuring Text and Library Books, and provides and recommends plans of School-houses; prepares annual Reports; corresponds with Local School authorities throughout Upper Canada, and employs all means in his power for the promotion of education and the diffusion of useful knowledge. He is responsible for

his official conduct and for all monies which pass through his department." (Dr. Ryerson's Report for 1852, pp. 267–271, and School Act.)

The Act allows the establishment of Township Model-Schools, the uniting of School sections, and the incorporation of Common and Grammar Schools, where these things are wished for. The sums to be raised by each Township are determined by the County Councils. Cities and incorporated Towns possess for School purposes the combined powers of the County and Township Councils.

Provision is made by the 19th section of the School Act of 1850 for the establishment, on the application in writing of twelve or more resident heads of families, of separate Schools for Protestants in School divisions in which the Teacher of the Common School is a Catholic, and for Catholics where the Common School Teacher is a Protestant;—as also for people of colour. These separate Schools are subject to the same regulations as the Common Schools; the right of voting for the election of their Trustees is restricted to the class for which the Schools are designed; and they are entitled to share in the School Fund according to the average attendance of pupils in them, the mean of summer and winter being taken.

The provision in the case of the coloured people is meant, not to operate in any way as an exclusion from the Common Schools, which are open to them on the same conditions with others, but to secure them a right where they may wish to enjoy it.

[An Act (18th Vic., cap. 131) received the Royal Assent on the 30th of May, 1855, which gives to five Roman Catholic heads of families "resident within any School section of any Township or within any ward of any City or Town," wishing to establish a separate School therein, the right of convening a public meeting "for the election of Trustees for the management thereof." By a majority of the Roman Catholic freeholders or householders attending such meeting, at which ten at least must be present, three Trustees—being British sub-

jects—may be chosen for the above purpose. On the Trustees thus chosen, who constitute a body corporate, the same power is conferred as is possessed by the Trustees of Common Schools, "to impose, levy and collect School rates or subscriptions upon and from persons sending children to, or subscribing towards the support of separate Schools, and all other powers in respect of separate Schools;" the same duties and responsibilities being devolved on them as are imposed on or required of the Trustees of Common Schools. Teachers of separate Schools are likewise made liable to all penalties provided against Teachers of Common Schools. These Trustees, of which the election is to be annual, are further empowered "to grant certificates of qualification to Teachers of separate Schools under their management, and to dispose of all School funds of every description coming into their hands for School purposes."

The separate Schools established as above are entitled to share in the fund annually granted by the Legislature, according to the average number of pupils attending them during the twelve next preceding months (such average being, at least, fifteen), as compared with the whole average number of pupils attending School in the same City, Town, Village, or Township. Half-yearly returns, to be verified on oath before a Justice of the Peace, of the names of children in attendance, average attendance for the period covered by the return, and number of months during which the Schools have been kept open, are required to be forwarded by the Trustees to the Chief Superintendent of Schools. The supporters of these Schools are exempted from the payment of the rates imposed for the sustaining of the Common Schools; but parties fraudulently returning themselves as such are "liable to a penalty of ten pounds currency, recoverable before any Justice of the Peace at the suit of the Municipality interested."]

By the 23d section of the Supplementary Act, which grants an addition of £4,000 per annum to the Common School fund of Upper Canada, the following allowances are made, viz.,

£1,000 per annum—over and above £1,500 previously given—making, therefore, £2,500 in all—towards the support of the Normal and Model Schools and for supplying the School Corporations and Superintendents with the *Journal of Education*, the amount to be devoted to the latter object being limited to £450; £500 per annum for the formation of a Canadian Library and Museum to be kept in the Normal School Buildings; and £500 per annum towards the formation of a fund "for the support of superannuated or worn-out Common School Teachers in Upper Canada," the "annual sum to be paid to each such Teacher not to exceed the rate of one pound ten shillings for each year that such Teacher shall have taught a Common School in Upper Canada." A contribution of one pound per annum is required to be paid by the Teacher towards the above fund to entitle him to share in it. The number of parties who are already reaping the advantage of this wise and generous arrangement, is considerable—some of them being between 70 and 80 years of age, and having taught for periods varying from twenty to between forty and fifty years.

The manner in which the Common School system is working is, on the whole, highly satisfactory. All parties concerned, —the Municipalities, the Boards, and the People on the one hand, and the Officers on the other,—throw themselves into it with a zeal which entitles them to grateful commendation, and which is full of promise for the best interests of the country. The spirit in which the Municipalities have met the liberality of the Government in its allowance of £3,000 per annum towards the establishment of Libraries, is beyond all praise, the sums which some of them have voted for this purpose being very large.

By the Act £1,000 per annum is granted in aid of the pupils in attendance on the Normal School, in addition to the sums already mentioned as allowed for its general support. The service which is being rendered the country by this excellent and admirably conducted institution is very great.

And it is being well appreciated, for from every quarter application is being made for Teachers trained there, whom a general disposition is being manifested to treat with liberality. The parties charged with the work of instruction in the Institution, are eminently qualified for the positions they occupy, and enjoy in large measure, not simply the confidence but the respect of their pupils—who, as a general thing, conduct themselves in a way which does credit alike to themselves and the country—and of all who stand in official connection, or have the pleasure of acquaintance with them. Of the Teachers of the Model School—in which the Teachers in training have the opportunity of exercising themselves—the same thing is true. Throughout the whole establishment, including Dr. Ryerson's Assistant [now Deputy Superintendent] and the Clerks in the Education Office, the spirit of the Superintendent appears to have been caught, each one feeling that an important and honorable work is entrusted to him, and throwing himself—and herself—with a hearty zeal into it. Enjoying the best opportunities of knowing what has just been stated, I feel the testimony I bear to be due to all parties, but to none more than the Government and the country at large, whose enlightened liberality has originated and is so generously fostering our whole Educational arrangements.

To the late Governor-General, his Excellency the Earl of Elgin—who laid the corner stone of the Normal School Building, and paid the institution a parting visit just before leaving the country—it is but justice to mention that he gave annually two valuable prizes of books for the encouragement of the study of Agricultural Chemistry, besides manifesting in other ways, in every way in his power, an affectionate interest in the establishment.

The following extracts from Dr. Ryerson's Reports for 1852 and 1853, and particulars thence collected, will give an idea of the condition of the Schools.

In the former of these Reports it is stated that the School sections in 1852 were 3,317—23 less than in the previous year;

and the number of Schools, 3,010—being 9 more than that of the year preceding. It is not, however, as is remarked, the number of Schools, but the number of pupils attending them, the time of keeping them open, and the amount expended for their support, that determines the state or progress of Common School instruction.

The number of *Free Schools* reported for 1852, is 901—"being an increase of 46 during the year; in addition to which, 429 are reported as partly free—making in all 1,330 that are supported, in part or altogether, by a self-imposed tax upon property." One shilling and three pence per month for each pupil is, as already noticed, the highest rate which can be imposed.

"The amount of the *Legislative Grant* apportioned to Common Schools in 1852, was £18,723 18s. 8d.—being £303 2s. 10d. *less* than the amount apportioned in 1851. The amount of the *Municipal Assessment* part of the School Fund in 1852, was £26,530 5s. 10d.—being an *increase* on the preceding year of £694 8s. 4d. The amount of *School Section Assessments* for *Free Schools* was £26,132 15s. 8d—being an *advance* on the preceding year of £6,300 2s. 1d. The amount of *Voluntary Subscriptions* and *Rate-Bills*, was £36,682 16s.—being an *increase* on the preceding year of £3,105 6s. 9d. The *totol amount* received in 1852 for the *Salaries of Teachers* was, £113,991 10s. 7d.—being an *increase* of £11,940 18s. 1d. on the amount received for the same purpose the preceding year. The amount raised for *Building, Repairs, Apparatus, &c.*, of School Houses, was £25,094 12s. 9d—being an *advance* on the receipts of the preceding year, for the same purpose, of £5,729 14s. 9d. The amount received in support of *other Educational Institutions*, was £36,989 15s. 10d—being an *increase* during the year of £4,155 8s. 2d. The *grand total* available (as far as reported) for *Educational Purposes* for the year 1852, was £176,075 19s. 2d—being an *increase* over the year 1851 of £21,845 1s." The sum therefore provided and expended for Educational purposes in

Upper Canada during the year 1852, exceeded thrice the gross amount of all local Taxes in 1845, which amounted, according to the returns, to £55,377 4s. 1d—less than one-half the amount of the taxes and appropriations for Common Schools in 1852.

"The *whole number of children* between the ages of 5 and 16 years reported for 1852, was 266,755—being only 4,148 more than the number reported for 1851. The number of boys reported as attending School, was 99,264, and the number of girls 80,323." The number of girls, however, who attend private Schools is much larger than of boys—a fact which helps to account for the difference above noticed.

In 1852 the National Arithmetics were used in 2,232 Schools, the National Readers in 2,925. "I know," says Dr. Ryerson, "of no instance in which so great a change and improvement has taken place in the Text-Books of a country during so short a period; and that without compulsion. It is also worthy of remark, that all those Text-Books (with one or two exceptions) are printed in Canada—thus encouraging domestic manufacture and enterprise, at the same time that the Schools are improved. I hope the period is not remote, when we shall be the publishers of our own School Libraries, as well as School Text-Books."

The *Bible and New Testament* were read in 1,890 Schools in 1852—an *increase* over the previous year of 142.

The number of Teachers employed during 1852 was 3,388 —"being 111 more than the number employed during a longer or shorter period of the preceding year." Of this number 2,581 were males—a *decrease* of 10 on the year preceding; and 847 females, an *increase* of 121.

Male Teachers received on an average during 1852, £83 6s. without board—an *increase* of £4 4s. each on the year previous. "The average salaries of Male Teachers, with board, was £62 17s—being an advance of £27 11s. each on those returned for the preceding year. The average salaries of female Teachers, without board, was at the rate of £52 12s., and with

board, £32 1s—an advance of £8 5s. each on those of the preceding year."

The Cities being excluded, the average salaries for 1852 were for a male Teacher, with board, £36 1s; without board, £50 7s. Female Teachers received, without board, £33 5s.; with board, £24 1s.

The averages for male and female Teachers, without board, were:

	Males.	Females.
In Toronto	£110 2	£55 11
In Hamilton	140 1	(No report)
In Kingston	79 9	42 10
Average of the three places,	£109 17	£49 1

In 1852 there was an increase of *first* and *second class* Teachers, with a decrease of those of the third class. The *first class* Teachers numbered 435—57 more than in 1851; the *second class*, 1,444—an increase of 172; and the *third class* 1,460—a decrease of 87. Of this last class it is stated that their qualifications are as high as were those of Common School Teachers generally in former years.

During 1852, 199 School Houses were built—18 of which were brick, 18 stone, 78 frame, and 85 log. The number of School Houses reported was 3,008—of which 127 were brick, 160 stone, 1,249 frame, 1,447 log, and 45 not reported.

For building School Houses there was received during 1852, £19,035 11s. 4d—an increase over 1851 of £6,008 14s. 10d. For Repairs and Rents the sum received was £4,988 9s. 9d.; *increase* over 1851, £556 13s. 9d. Total amount for building, repairs and rent, £24,024 1s. 1d—being an increase of £6,565 8s. 7d.

In 1851 the Schools were provided with 2,027 maps of the world and continents. The number in 1852 was 1,692—only 335 fewer—a fact at once remarkable and gratifying when the largeness of the previous supply is considered.

The Schools were supplied in 1852 with 666 maps of Ca-

nada—an increase of 597; other maps, 1,454—an increase of 522. The total number of maps in the Schools in 1852, was 3,809—an increase of 1,014,—"more than one-fourth of the whole number."

In 1851 there was expended for apparatus of different descriptions, £1,533 7s. 3d.; and in 1852, 1,066 12s. 8d—a diminution of £446 14s. 7d., occasioned it is to be presumed by the largeness of the previous supply.

In 1852 there were reported 861 Sunday School Libraries, with 124,031 volumes—an increase of 177 libraries and 27,945 volumes; Public Libraries 141, with 37,679 volumes—the increase of Libraries being 45, and of volumes 7,911. Total Libraries reported, 1,045; volumes, 164,147—the increase of Libraries being 175, and volumes 33,213.

The separate Schools in 1852 were 25 in all—3 Protestant, 18 Roman Catholic, and 4 coloured.

The cost of the Normal School Buildings—including a square of 8 acres of land in what is now one of the finest parts of Toronto, with its preparation and culture for the first year, was £25,000—a sum well and nobly spent, and yielding already a return more than justifying its expenditure. (Report for 1852, pp. 9–14.)

As the Report for 1853, which was published only eight months after that of 1852, directs attention to the latter, we have thought it necessary in order to a correct view of the state of the Schools, to give the above particulars.

In the commencement of his Report for 1853, Dr. Ryerson states that "the statistical Tables show the largest increase, in every particular indicative of progress, which has ever taken place in any one year in Upper Canada."

There were in 1853, 3,127 Common Schools open in Upper Canada, 17 more than during 1852; attended by 194,736 pupils, an increase over the previous year of 15,194. Of these Schools 1,052 are reported free—an increase of 151. The number of Teachers employed was 3,539 (2,601 male and 938 female)—an increase over the year preceding year of 151; to

whom there was paid as salaries £130,039—being an increase as compared with 1852 of £16,048. Towards the erection and repair of School Houses and the providing of Libraries and apparatus there was raised £32,018—an increase of £6,924. These amounts make a grand total of £161,769—an advance on the previous year of £22,684.

In addition to the Common Schools 174 Private Schools are reported as having been in operation during 1853—7 over the number of the year 1852; 79 County Grammar Schools and Academies—5 over the previous year; with 8 Colleges—the same number as that reported for 1852. The number of pupils attending Private Schools is reported to have been 3,822—a decrease as compared with 1852 of 1,311. Of pupils in attendance on Grammar Schools and Academies the number was 3,839—being an increase on the year preceding of 645. The number of students attending Colleges and Universities in 1853, was 756—an increase of 5. The reported income of these Institutions during the year 1853 was £37,526—£537 more than during 1852.

To the above have to be added 735 pupils in attendance on the Normal and Model Schools during 1853—90 over the number of 1852.

The whole number of pupils attending these various Educational Institutions in Upper Canada in 1853 was 203,986—an increase over 1852 of 14,676. For education there was available during the year named within Canada West the sum of £199,674—an increase over the preceding year of £23,598 2s. 3d.

The number of separate Schools reported for 1853 is 24.

To over-estimate the beneficial influence of the mingling together of our rising population in a connection so close and generous, on either the comfort of the parties themselves when called to act together in future life, or the country to which its direct tendency is to give the full advantage of the capabilities and resources of its inhabitants, would be difficult.

Of the pupils in the Common Schools in 1853, 19,314 are reported as being over 16 years of age; 175,422 between 5 and 16.

There were during 1853, 33,114 pupils attending the first or lowest reading class; 36,150, the second; 41,510 the third; 35,640, the fourth; 31,933, the fifth or highest. The pupils in Arithmetic were distributed as follows—36,572 learning the first four rules; 24,156 in the compound rules and reduction; and 23,061 in proportion and the rules more advanced. The Grammar pupils were, 29,650; Geography, 41,135; History, 9,325; Writing, 84,972; Book-keeping, 2,931; Mensuration, 1,441; Algebra, 1,869; Geometry, 1,126; Elements of Natural Philosophy, 4,370; Vocal Music, 10,804; Linear Drawing, 2,473; other studies, 2,370.

The Bible and New Testament were read in 1,777 of the Schools during the same year.

In regard to the Religious instruction of the pupils attending the Common Schools, the School Act (section fourteenth) provides "that in any Common or Model School established under this Act, no child shall be required to read or study in or from any religious book, or to join in any exercise of devotion or religion, which shall be objected to by his or her parents or guardians: Provided always, that within this limitation, pupils shall be allowed to receive such religious instruction as their parents or guardians shall desire, according to the general regulations which shall be provided according to law."

While, however, the public religious exercises of each School are left as a matter of mutual voluntary arrangement between the teacher and the parent or guardian of each pupil, the principles of religion and morality are expected to be inculcated upon all,—the teacher exerting his best efforts, by both example and precept, to impress upon the minds of all children and youth committed to his care and instruction, the principles of piety, justice. and a sacred regard to truth, love to their country, humanity, and universal benevolence, sobriety, industry, frugality, chastity, moderation, and tempe-

rance,—and those other virtues which are the ornament of society, and on which a free constitution of government is founded; and endeavouring to lead his pupils, as their age and capacities will admit, into a clear understanding of the tendency of the above-mentioned virtues, in order to preserve and perfect the blessings of law and liberty, as well as to promote their future happiness, and also to point out to them the evil tendency of the opposite vices. (Report for 1853, pp. 169, 170.)

The number of students who have attended the Normal School from the time of its commencement in 1847 till the close of the 11th session, 1853–54, is 1,264—833 males, and 431 females. In regard to religious belief, they stand as follows—viz., Church of England, 213; Roman Catholics, 75; Presbyterians, 266; Methodists, 483, Baptists, 110; Congregationalists, 48; Lutheran, 1; Quakers, 12; Universalist, 1; Unitarians, 4; Disciples, 14; other persuasions, 30.

Notice has been taken of the connection of a Library system with the Public Schools. It is not much beyond a year since it went into operation; but it is now in full play, covering the country with books of the best class in all the more common and important departments of Literature. Between the latter part of November, 1853, and the close of October, 1854, there were sent out from the Depository, 81,965 volumes, —of which 13,783 were on History; 6,711, Zoology; 1,192, Botany; 2,899, Phenomena, &c.; 1,763, Physical Science; 798, Geology, &c.; 1,233, Natural Philosophy; 709, Chemistry; 498, Agricultural Chemistry; 3,629, Practical Agriculture; 3,938, Manufactures; 7,225, Modern Literature; 627, Ancient Literature; 5,007, Voyages, &c.; 8,678, Biography; Tales and Sketches—Practical Literature, 22,556; Teachers' Library, 719. The number issued since the above statement was prepared brings the volumes for the year up to nearly 90,000. (Report, p. 134, 10.) School authorities purchasing obtain Books double the amount in value forwarded by them.

We may possibly have gone somewhat too largely into our School system and operations, but the importance of their bearing on the character and condition of the country—present and prospective—must be our apology.

Reference has been made to the existence of Grammar Schools in Upper Canada.

The following particulars are all our space will admit in relation to them.

So early as 1797—five years only after Upper Canada was constituted a distinct Province—a joint address was presented by the Legislative Council and House of Assembly to his Majesty George III., imploring that he "would be graceously pleased to direct his Government in this Province to appropriate a certain portion of the waste lands of the Crown, as a fund for the establishment and support of a respectable Grammar-School in each District thereof; and also a College, or University, for the instruction of youth in the different branches of liberal knowledge."

To the above application a favourable reply was given by the Home Government, who desired to be informed by the Provincial Executive, after consultation with the Law Officers of the Crown, "*in what manner and to what extent*, a portion of the Crown Lands might be appropriated and rendered productive towards the formation of a fund for the above purposes." By the Executive Council it was suggested, in compliance with the invitation thus given them, "that an appropriation of 500,000 acres, or ten townships, after deducting the Crown and Clergy sevenths, would be a sufficient fund for the establishment and maintenance of the Royal Foundation of four Grammar Schools, and an University." It was further suggested that the Grammar Schools recommended to be established should be located at Cornwall, Kingston, Newark (Niagara), and Sandwich, and the University at York, now Toronto. The action taken on the Report of the Executive making these recommendations is not known. (Origin, &c., of King's College, pp. 9, 10.)

An Act was passed in 1807, granting £100 per annum "to the Teacher of one School, in each of the eight Districts of the Province, under the direction of Trustees." The above Act, limited at first to four years was afterwards made permanent. (Gourlay, Vol. 1,, p. 245.)

Instead of being confined to the Districts, Grammar Schools have been extended to the Counties, and also to the Cities, Towns, and more important Town Municipalities and Villages. Their present number is 64. An allowance has been made annually of £100 to the senior Grammar School of each county, with an amount varying according to circumstances to the other Schools. On the whole the average cannot have been much below £100, as the sum reported as received for 1853, is £5,783. From fees, the amount reported for the same year is £4,960 11s. 1d. The number of pupils returned is 3,221. (Dr. Ryerson's Report for 1853, p. 40.)

The proceeds of the Grammar School Fund, consisting of interest on investment (£41,962 6s. 8d—2nd Report on Accounts, p. 37) in Provincial securities, on sums deposited in the Banks and, on sales of lands, with rents of leased lots, amounted in 1853 to the sum of £3,422 18s. 1d. (Public Accounts for 1853, p. 280.)

By an Act of the Legislature, assented to 14th June, 1853, the Grammar Schools are placed under the care of the Council of Public Instruction; of which the President of University College and the President or other Head of each of the Colleges in Upper Canada affiliated to the University of Toronto are constituted members for the purposes of the Act. The same relationship is henceforth to exist between the Grammar Schools and the Municipalities on the one hand, and the Superintendent of Education on the other, as exists in the case of the Common Schools. Provision is to be made in each School "for giving instruction, by a Teacher or Teachers of competent ability and good morals, in all the higher branches of a practical English and Commercial Education, including the elements of Natural Philosophy

and Mechanics, and also in the Latin and Greek languages and Mathematics, so far as to prepare students for University College, or any College affiliated to the University of Toronto, according to a programme of Studies and General Rules and Regulations to be prescribed by the Council of Public Instruction for Upper Canada, and approved by the Governor in Council." In accordance with the above enactment a programme has been prepared embracing a course of study of a very superior character, along with a set of rules well fitted to secure the ends contemplated, to both of which the assent of the Government has been given. A sum has likewise been granted for the establishment of a Model Grammar School in connection with the Normal School, "in which the best modes of learning the elements of the Greek and Latin, French and German languages, the elementary Mathematics, and elements of Natural Science, will be attempted to be exemplified, and where Teachers and Candidates for Masterships in Grammar Schools, may have an opportunity for practical observation and training, during a shorter or longer period. Such a School will complete the educational establishments of our School system, and contribute powerfully to advance Upper Canada to the proud position which she is approaching, in regard to institutions and agencies for the mental culture of her youthful population." (Dr. Ryerson's Report for 1853, p. 11.)

As in the case of the Common Schools, the Municipalities are authorized to assess for the support of the Grammar Schools.

The new arrangements, from which the highest advantages may reasonably be anticipated, will be in full operation forthwith.

With the view of affording facilities for a superior education, Upper Canada College—in which the Royal Grammar School previously existing was merged—was instituted in 1829; and opened in 1830, with a considerable staff of Teachers. In the years 1832, 1834, and 1835 it received endowments of land,

amounting in all to 63,268 acres, irrespective of two valuable blocks in York—now Toronto—on one of which the present College buildings stand, while it still retains a portion of the other, and is drawing a revenue from the part of it which has been sold.

The College further "received an allowance from Government of £200 sterling in 1830; £500 sterling in 1831; and £1,000 sterling per annum" since. In January, 1850, there remained in the possession of the College, 41,941 acres of the lands bestowed on it—the quantity sold up to that time amounting to 22,048 acres.

Including the Principal, the staff of the College consists of thirteen Masters, three of whom are Classical, one Mathematical, and one French. Drawing and Music, vocal and instrumental, are taught, in addition to the ordinary branches of an English and commercial education. Instruction is also given, where desired, in German and Hebrew. Somewhere about £200 per annum is expended in exhibitions and prizes for the encouragement of the pupils, who number about two hundred. Since 1843 it has been under the superintendence of F. W. Barron, M.A., who in that year succeeded the Rev. Dr. McCaul, the present learned President of the University of Toronto, in the office of Principal, and has the reputation of being an able Teacher. The standing occupied in the community by many of the old pupils of this institution, as well as the success with which numbers of its more recent ones have competed for University honours, may be held to afford fair evidence of the ability and diligence of the Masters. The general regulation of the College is placed by the late University Act in the hands of the Senate of the University of Toronto, by whom it is hoped such improvements may be suggested as may fit it to render yet more valuable service to the country than it has done in the past.

Notice has already been taken of the fact that at an early period of the history of Upper Canada the establishment of a

Provincial University was contemplated. In fulfilment of this design, in connection with the support of Schools, a grant was made in 1798 of 549,000 acres of land in different parts of the Province. "Of the above land endowment, 190,573 acres were, up to the year 1826, assigned to (or disposed of by) a public body, known as the Board of Education, the proceeds having been applied to the support of Common and Grammar Schools." "The residue of the grant, amounting to 358,427 acres, appears to have been regarded . . as properly constituting that portion of the Royal gift which had been intended for the support of the contemplated University." Of these lands, or so much as remained of them undisposed of, an exchange was made, on the suggestion of his Excellency Sir P. Maitland in 1825, for 225,944 acres which were regarded as more valuable, that a commencement of the proposed University might be the earlier made. (Report of Commis. of King's College, p. 16.)

A Royal Charter of Incorporation, bearing date 15th March, 1827, was granted constituting the University of King's College, by which its government was entrusted to a Council, consisting of the Chancellor and President for the time being, and of seven of the Professors, who were to be members of the Church of England, and who were required, previously to their admission into the Council, to sign and subscribe the Thirty-Nine Articles of that Church. In the event of there not being seven Professors in Arts and Faculties, the deficiency was to be supplied by the introduction of other parties being members of the Church above-named and graduates of the Institution.

The above Charter, proving unsatisfactory to the country in consequence of its exclusive character, was subsequently so amended as to require no test from parties holding office beyond a declaration of their "belief in the authenticity and Divine inspiration of the Old and New Testaments, and in the doctrine of the Trinity." On this principle the University was opened for purposes of instruction in 1843. Disappointment being still felt in regard to the working of the institution, a Bill was

introduced by Hon. Robert Baldwin and passed by Parliament, placing the different sections of the community in a position of equality in relation to it. A further change was made in 1853, by which the University and the Collegiate powers were separated, and the faculties of Law and Medicine abolished. For the restoration of these, however, at no distant period, there seems reasonable ground to hope. The work of instruction is now conducted by University College, in which the gentlemen who occupied Chairs in Arts in King's College were made Professors by the new Bill, several parties being at the same time appointed to new Chairs which had been previously instituted. The staff consists of the learned Principal, Rev. Dr. McCaul, who is also Professor of Classical Literature and of Logic and Rhetoric, with Professors of Metaphysics, Mathematics, Chemistry, Agriculture, History and English Language and Literature, Geology and Mineralogy, Natural History, and Modern Languages, and a Lecturer on Oriental Literature. [A Professor of Meteorology—who is to be at the same time Director of the Magnetic Observatory—has been recently added.] In so far as the capability and the character of these gentlemen are concerned, the Institution must be regarded as singularly fortunate. It is our persuasion, and we speak not without opportunities of knowledge, that they will compare favourably with the Professors of Institutions elsewhere much older and of greater name. An education of a high order is obtainable in this excellent institution for a mere trifle—£3 currency per annum, or $12—a sum which places it within easy reach of the mass of the community. Occasional students are admissible to all the classes at fees varying from 10s. to 25s. each per Session, according to the number of Lectures attended. The University Powers are vested by the late Bill in a Senate which includes the Hon. Hume Blake, Head of the Court of Chancery,—who is also Chancellor of the University,—the President of University College, the Hon. Justice Draper, the Superintendent of Schools, the President of Victoria Col-

lege, the President of Bytown (now City of Ottawa) College, with the Heads of three Theological Colleges or Institutions located in Toronto, and a number of gentlemen in different parts of the country,—among them the Hon. Adam Ferguson,—enjoying the confidence and respect of the community.

In fulfilment of the trust reposed in them statutes have been passed by the Senate, to which the assent of the Government has been given, establishing courses of study for Degrees in Arts, Law, and Medicine, and for Honors in Agriculture, Oriental Literature, and Civil Engineering. The University Bill affiliates all such Collegiate Institutions in the Province as may choose to avail themselves of the privileges held out by it. Parties resident in any of these, or in none, may obtain Degrees by passing the prescribed examinations—at present annual. The course for Arts is divided into four years; but individuals properly qualified, and being of the age of sixteen years, may, by passing an examination on the studies of the first and second years, enter in the middle of it, thereby securing their Degree, for which no fee is exacted, in two years.

For the encouragement of the youth of the country, and with a view to the assistance of such as may desire a learned education, yet be so situated as to find it difficult to secure it without pecuniary aid, ninety Scholarships, of the value each of £30 currency per annum, have been established, —sixty in Arts, ten in Law, ten in Medicine, five in Agriculture, and five in Civil Engineering—open to the competition of the whole country. The successful candidate, whose retention of his position is made dependent on the result of the annual examination, is at liberty to enrol himself in any one of the affiliated Institutions he may prefer attending. The countries we believe to be but few in which such advantages may be secured. It is to be hoped they will be duly appreciated, in which case the happiest results may be confidently anticipated. For the meeting of the expense which these provisions necessarily involve, the endowment of the University, which is rapidly becoming more valuable through the rise tak-

ing place in land, is ample, the income for the year 1853 being stated by the Bursar (D. Buchan, Esq.), in his annual Report to Parliament for that year, to have been over £16,000.

There are in Canada West three other Universities, to wit, Queen's College, Kingston—with ten Professors, five in Divinity and Arts, and five in Medicine; Victoria College, Cobourg, —with four Professors in Arts, a classical Tutor, and English Teacher, and a Medical Staff (Toronto School of Medicine) of four Professors; and Trinity College, Toronto, with four Professors in Divinity and Arts, three in Law, six in Medicine, and a Professor of Music. The gentlemen occupying these positions are recognised as men of ability and character, and the Institutions themselves, though denominational, are rendering the country important service. £500 each per annum is allowed to Queen's and Victoria Colleges from the public funds. There is also in Kingston a Roman Catholic College, with four or five Professors, and another in Ottawa City (late Bytown) with several—which receive aid to the same amount. In Toronto, the Free Church, the United Presbyterians, the Congregationalists and the Roman Catholics have Theological Institutions, or Colleges, for the preparation of candidates for the Ministry, and one instituted some time since by the Baptists (Maclay College) is expected soon to be opened. Toronto is besides the seat of a Law Society by which candidates are admitted to the Practice of Law, and of a Medical Board, appointed by the Government, whose duty it is to examine and recommend applicants for licence to practice Physic, Surgery and Midwifery, with a view to their licensure by the Governor General.

["The Arts' course at Trinity College extends over three years, and two additional years are required in the case of Theological students who have not entered the Divinity class before completing their term. Students are, however, allowed to join the Divinity class at the end of either their first or second year, provided that they have attained the age of 21

years, and are considered by the Professors to be sufficiently advanced.

Five Divinity Scholarships are annually awarded, according to the results of an examination, held in the beginning of October, which is open either to students already admitted, or to Candidates for Matriculation. Of these Scholarships, one is of the value of £30, two of £25, and two of £20.

There are also two Scholarships of £40 currency, tenable for two years, founded by the Society for the Propagation of the Gospel; one of which is awarded annually to the most deserving Bachelor of Arts entering the Theological class.

The College has been endowed with the following Scholarships for students in Arts:

Two Scholarships of the annual value of £50 currency, tenable for two years, founded by his Grace the late Duke of Wellington.

Two Scholarships of £30 currency, tenable for three years, founded by the late Alexander Burnside, Esq.

One Bishop Strachan Scholarship of £30, tenable for three years.

Two Scholarships of £30, tenable for three years, founded by G. W. Allan, Esq.

(The above Scholarships are awarded according to the result of the annual examination in June, to the most deserving students of the first year.)

Two Scholarships of £25, tenable for three years, founded by the Hon. J. H. Cameron, restricted to the sons of clergymen resident and doing duty in British North America.

These Scholarships are awarded, when a vacancy occurs, at the annual examination in October, to some candidate for Matriculation.

Robert Denison, Esq., has founded an Exhibition of £30 per annum, tenable for three Years, by a student in Divinity or Arts, to which he himself presents."

Residence—the expense, including fees, not exceeding £50 currency per annum—is required of students in Theology and

Arts, except in the case of such as reside with their parents in Toronto.—Mr. Widder's Pamphlet, p. 11.]

In its general principles the School Law of Lower Canada (9th Vic., cap. 50th ; 13th and 14th Vic., cap. 97th) corresponds with that described as in force in Canada West, though there are some points of difference between them.

The Act commands that from the time of its being passed, "there shall be in each of the Cities of Quebec and Montreal, and in each Municipality, Town or Village in Lower Canada, one or more Common Schools for the elementary instruction of youth," to be managed by School Commissioners, five of whom are to be elected by each Municipality. Except in the case of Ministers of religion, a property qualification to the extent of £250 is requisite to eligibility as a Commissioner. Should any Municipality fail to make the required election of School officers, or Commissioner, provision is made by the Act for their appointment by the Governor in Council through the Superintendent. Commissioners, where not otherwise appointed, may be appointed by the Superintendent on the recommendation of certain parties, including the representatives of the different religious denominations, in case of his approval of their nomination. These Commissioners, whose term of office is three years, unite in some respects the powers of Trustees and Municipalities in Upper Canada—being authorised to divide the Municipalities into School-districts, containing not less than twenty children between the ages of five and sixteen, with the exception of one in each Municipality—which may have a smaller number; to take charge of School property ; engage Teachers; regulate course of instruction ; decide disputes between parents and children and Teachers ; appoint one or two of themselves as visitors and report ; manage discipline; keep registers and accounts ; levy by assessment in each Municipality a sum equal to that derived from the School-fund; fix the rates to be paid for the pupils ; make allowance, at their discretion, of an additional sum not ex-

ceeding £25 per annum for the support of a Model or superior School at the most thickly settled place of the Municipality ; with other things necessary to the efficient working of the Schools.

The Fabrique School of any parish may, by mutual agreement with the Commissioners, be united with any of the Schools to be kept under the Act, the contributing of the sum of £12 10s. per annum towards the support of any such School procuring at the same time for the *Curé* and Churchwarden in office the right to act as Commissioners.

Parties differing in regard to religious belief may, if they please, have separate Schools, under the direction of Trustees chosen by themselves, who shall possess in relation to such Schools the powers of Commissioners.

Two Boards, one Roman Catholic and one Protestant, are appointed for Montreal and Quebec. These Cities, in consequence of the number of educational Institutions established in them, are allowed, in proportion to numbers, only two-thirds of the sum granted generally.

Resident Clergymen, of whatever denomination, the Judges of the Court of Queen's Bench and of the Circuit Courts, Justices of the Peace, the Mayor or Warden of the Municipality, Colonels, Lieutenant-Colonels and Majors, and the senior Militia Captain in the Municipality are visitors. Ecclesiastics of the one persuasion are, however, restrained from visiting the Schools of the other.

For the general oversight there is a Superintendent of Schools as in Upper Canada, with School Inspectors, who perform the duties there performed by Township, District, and County Superintendents.

For a time difficulty was found, in some places, in carrying the provisions of the law into effect. Now, however, there appears to be a general concurrence in it, and the Schools are reported as progressing in efficiency, as well as in favour with the people.

In the year 1850–51, the number of Schools in Lower Canada was 1,991 ; and of pupils, 79,284. The former numbered in 1852, 2,272 ; and the latter, 97,582 ;—being an increase of 286 Schools, and 18,298 children. For 1853 the educational institutions reported are 2,352, and the number of parties under instruction, 108,284.

"Of these institutions, 2,114 are Primary Schools, 67 Model, 53 marked as "Principal" Girls' Schools, 19 Academies or educational houses, preparatory to a Clerical Course, 14 Classical Colleges, and 44 Convents. There are also 85 independent Schools. The relative numbers of the pupils as found among these various institutions are as follows : The Primary Schools contain 92,275 ; the Model, 3,524 ; the "Principal" Girls' Schools, 3,041 ; the Academies, 1,169 ; the Classical Colleges, 2,110 ; the Convents, 2,786 ; and the independent Schools, 4,923."

"The number of the A. B. C. classes, viz., those who know their letters familiarly, is 55,331, more than one-half the whole number ; those who read well, 27,867, considerably above a quarter of the number of Scholars." Those able to write amount to 50,072, nearly one-half of the whole number of pupils. "In simple arithmetic there are 18,281 ; in compound, or those past the five elementary rules, 12,448 ; in geography, 12,185 ; and in history, 6,738 ; grammar, French, 15,353 ; and English, 7,066." The whole number knowing the analysis of speech is stated at 4,412. The number of male Teachers in all the Schools, is 808 ; and of female, 1,402—2,212 in all, the average number of pupils to each being about 50.

"The amount of grants is collectively £27,434 18s. 6d., and the amount of contributions £41,462 1s. This last is independent of fuel and of Teachers' board generally furnished, and which, it is supposed, carry the contributions virtually to the value of not less than £50,000."

In the number of educational institutions there is an increase over the year 1852, of 75. The pupils number 10,792 more than in that year.

"The Chief Superintendent speaks in terms of strong confidence of the aspect of the cause of education in Lower Canada, in which we feel sure he will be joined by every well-wisher to the country whatever may be his political party or religious distinction." (*Leader* Newspaper—analysis of Dr. Meilleur's Report for 1853, quoted from *Journal of Education*, U. C., for July, 1854.)

Dr. Meilleur points out in a return (dated 20th April, 1853) made by him in compliance with an address of the House of Assembly, certain considerations which should, he thinks, be borne in mind when comparisons are made between the working of the School systems in Upper and Lower Canada, to wit, the pecuniary inability of the latter as compared with the former, the more limited powers of the Municipalities, and the differences in language and religion, which make a double set of arrangements necessary where in other circumstances one would be sufficient.

Special emphasis is laid by him on the want of a Normal School and Journal of Education. These wants will, it is to be hoped, be soon supplied. At a comparatively moderate expense the latter may be furnished. Provision for it must, we presume, be included in the additional sum granted this year to Lower, in common with Upper Canada. For a Normal School—two rather, viz., one for the Roman Catholics and one for the Protestants—an allowance has, we believe, been made.

[From a communication by Dr. Meilleur—late Superintendent for Lower Canada—contained in the *Montreal Transcript* of 4th July, 1855, we extract the following

COMPARATIVE TABLE,

Showing the progress made in the course of one year, under the auspices of the Primary School Law, viz.:

	1853.	1854.	Augmentation in 1854.
Number of Educational Institutions of every description	2,352	2,571	219
Total number of Pupils.....	108,284	119,737	11,453
No. of Elementary Schools (Primary)..	2,115	2,352	238

(*Comparative Table Continued.*)

	1853.	1854.	Augmentation in 1854.
No. of Pupils, do.	92,275	97,310	5,035
Model Schools, do.	67	154	87
Pupils, do.	3,524	6,747	3,223
Superior Girls' Schools	53	67	14
Pupils	3,041	3,170	89
Teaching Nunneries	44	46	2
Pupils	2,786	6,104	3,318
Academies	19	23	4
Students	1,169	1,272	103
Colleges	14	16	2
Students	2,110	2,515	415
Pupils learning Simple Arithmetic	18,281	22,897	4,616
Do. Compound do.	12,448	18,073	5,625
Do. French Grammar	15,353	17,852	2,499
Do. English Grammar	7,066	7,097	31
Do. Geography	12,185	13,826	1,641]

The place of the Grammar Schools of Upper Canada seems occupied in Lower Canada by Academies and Colleges, of which the number is large. In the estimates for 1854 the names of nearly 100 of them are given, to which grants, varying in amount, are made from the Public Funds.

Irrespective of the allowance of £250 each to the School of Medicine in connection with M'Gill College, the Faculty of Medicine of Laval University, Quebec, and the Montreal School of Medicine (the Medical Faculty of Queen's College, Kingston, receiving a similar amount), as also of sums paid to Mechanics Institutes and other Literary Institutions, over £45,000 are appropriated in the estimates for 1854 to education in Lower Canada.

In Lower Canada there are two Universities, viz., Laval University, Quebec, with 22 Professors and 385 students; and the University of M'Gill College, Montreal, which has six Professors in the Faculty of Arts; one Professor and two Lecturers in that of Law; and in the Faculty of Medicine, which enjoys a high reputation, eleven Professors. It is to be hoped,

that the efforts lately made to give the latter institution a national character may be crowned with success, so as to make it prove a source of high advantage to Lower Canada at large, not less than to the city in which it is located.

To the Colleges noticed in the abstract given of Dr. Meilleur's Report have to be added, we presume, Bishop's College, Lennoxville (Eastern Townships), with four Professors ; and the Seminary at Montreal, with 18 Professors, and 250 students.

In 1824, the Historical Society of Quebec, which has done itself and the country honour by its published Transactions, (comprised in three volumes,) was founded under the auspices of Earl Dalhousie. "Besides its Library, rich in historical lore, the Society possesses some very valuable manuscript documents, relating to the History of Canada."

"The Natural History Society of Montreal, established in 1826, has a good Library, furnished with the best scientific works, and an extensive museum."

"Mercantile Library Associations have been formed in Quebec, Montreal, and several other places, and have been productive of great benefit." (Canada Directory, p. 555.)

The Canadian Institute (established in 1849), though located at Toronto, is a National Institution. Young though it be, it is already distinguishing itself, and promises to be of inestimable advantage to the country. Its Journal, under the able superintendence of the Professor of Chemistry in Trinity College (Mr. Hind), is a work of very superior character—supplying a channel through which the cultivated and scientific mind of the country may pour forth its best thoughts for the instruction of the community, as well as furnishing to its readers valuable, and often curious information.

In connection with the above have to be named a class of Institutions which, though as yet comparatively in their infancy

among us, are already conferring on Canada many of the benefits of which they have been found so largely productive elsewhere, viz.—our Mechanics' Institutes. Of these, I find from a list enumerated in the Public estimates, we possess forty-three, the larger portion of them in Upper Canada; besides several Institutes in Lower Canada, which I suppose to be substantially of the same description, though under other names. To each of these an allowance is made annually by the Government of £50 currency—which cannot be regarded otherwise than as money well spent. Speaking generally, the spirit in which these Institutions are conducted is worthy of all praise. Largely may they multiply and prosper, and successful may they prove in their honorable endeavours to improve their members and elevate the country.

Aid, we omitted to state, is granted to the Literary and Historical Society of Quebec, the Natural History Society at Montreal, the Canadian Institute, Toronto, which receives £250, and the Toronto Athenæum. There is likewise a grant made of £1,200 towards the maintenance of a Nautical College lately established at Quebec.

Towards the support of Hospitals and other Charities an appropriation stands among the Estimates for 1854 of £30,811 18s. 6d—of which £10,000 are for the support of a Temporary Lunatic Asylum at Beauport, near Quebec; £10,000 for the Lunatic Asylum, Toronto; £1,000 each for aid to the Commissioners of Indigent Sick, at Quebec and Montreal; £1,000 each for the Montreal and Toronto General Hospitals; —and for other Institutions of a kindred character sums varying from £75 up to £800—the amount allowed to the Hamilton General Hospital. Kingston receives £600, and the Toronto and Kingston Houses of Industry £500 each, to which is added £500 for the relief of indigent and destitute sick in the latter city.

The influence which the Press is exerting over the formation of the country's opinions, feelings and institutions, and hence over its destiny, entitles it to our respectful notice in this sketch, hurried as it is.

The number of Newspapers published in Canada in 1810 was five, we are told by Mr. Smith, all in the Lower Province. In the supplement to the Canada Directory, published in 1853, the names of 158 Newspapers and Periodicals are given; 113 of which are reported as issued in Canada West. I have seen a number of additions to that list, and believe that since its publication not a few, with the names of which I am unacquainted, have come into being, as one of the earliest objects of ambition with our rising villages is to have a paper of their own. Besides this, several of the papers entered on the list referred to under one name, constitute, properly speaking, more than one, inasmuch as daily and weekly, and in some cases, daily, weekly, and semi-weekly editions of them are issued. Taking these considerations into account, it may be fairly reckoned that we have at least 175, or 180 of them in all—probably indeed not much under 200. Of those reported, one (printed at Berlin, in Canada West) is in German, 13 are in French, and 145 in English. While in some cases improvement may be called for in regard both to the ability with which they are conducted, and the spirit by which they are characterised; taken as a whole we have by no means occasion to be ashamed of them. Mr. Buckingham (p. 247) speaks of them as,—when he visited us, fifteen years ago,—generally superior to those of the provincial towns of the United States, a judgment from which we conceive few will dissent who have seen the things with which the parlour tables of the Hotels on the other side are sometimes covered—in the newer portions of the country especially. Since the time of his visit, they have certainly not deteriorated; but improved. That they are rendering the country very great service will, we imagine, be universally

admitted. If sometimes they may send forth a voice a little too harsh, even this is less mischievous than if they spoke only in whispers.

Over and above the appliances already noticed, we have between 1,200 and 1,300 Post-Offices spread over the country, with cheap letter and book rates—to which the adoption of the Money-order system has lately been added ; with the Electric Telegraph extending from one end of it to the other, affording its facilities for communication to the inhabitants, not merely of our cities and larger towns, but, in many cases, of our smaller villages. Indeed it would be difficult to name any of the conveniences possessed by older countries—not excepting those in which the largest advancement in civilization is found in connection with the most abundant means—which we want.

There is an instrumentality at work among us, still more powerful and precious than those we have hitherto noticed—that to which the best of these must ever owe whatever is most valuable in the fruits produced by it—which is shedding its mellow light upon us, moulding our character, giving form to our Institutions, and preparing, as we believe, a high, and honorable, and happy destiny for us ;—need I say that it is to Christianity I refer, "the glorious Gospel of the blessed God," which an experience of eighteen hundred years has proven to be the grand civilizer and elevator of our race, the one source of the "righteousness which exalteth a nation." God having in his goodness distinguished us in this respect, as well as in many others, be it ours to return His kindness with a loving fidelity, and to transmit to those who shall come after us, as well as spread now through the length and breath of our splendid country, the boon with which we have, happily for ourselves, and (may it not be hoped?) for the world, been enriched from such an early period in our history. Differences of view exist among us, as they do everywhere less or more on every thing, with the exception of what are termed the exact

sciences, on which men exercise their thoughts ; though these are both fewer and less vital than is sometimes supposed. In one thing, however, we are, it is to be hoped, agreed, namely, in the appreciation (deficient it may be in degree, still real), of the truth as understood by us, and in the desire to be governed individually and as a nation by God's commands, whose tendency is in all cases as beneficial, as their character is righteous and holy. While I would be most unwilling to convey the idea that we are in these matters all, or nearly all we ought to be, I regard it as due to truth and to the world,—not to say to God, whose honour is involved,—to express the opinion that we would bear, in relation to them, a comparison not very unfavourable with most other countries called Christian. A great deal is doing by the different Denominations for the diffusion of their principles, and the establishment of their institutions. Particulars I would be happy to give in relation to these, did I possess the means of supplying them generally. This not being the case, I prefer omitting what I might perhaps introduce without much impropriety, that I may avoid the appearance even of that which is sectional when called on to speak of the country. Suffice it to say, that most of the bodies have among them missionary organizations, and that the Societies which exist in the countries whence we or our fathers came, have their representatives, and, in some cases, their auxiliaries among us.

The Census Returns for 1852 report 610 places of worship for Lower Canada, being equal to one for every 1,459 inhabitants. No means, it is stated, was possessed of arriving at their value, or the amount of accommodation afforded by them. In Upper Canada the number reported for the same year is 1,559, "being one place of worship for every 612 inhabitants, affording accommodation for 470,000 persons, and at an average cost of £300, amounting to £467,100." How near the numbers stated above may approximate to the numbers actually existing we cannot say. Those only are reported of which returns were made.

The Census reports 620 as the number of Clergymen for Lower Canada, and 963 for Upper—in all 1,583.

In Canada West the number of places of Worship reported has increased between 1828 and 1852 from 141—150 to 1,559; and of Ministers from 236 to 963 ;—the Churches being thus more than ten times their number (taking that at 150) 24 years before, and the Ministers more than four times.

In the character of the places of worship built the improvement between these two periods is likewise very great.

The Roman Catholics of Lower Canada possess a large amount of Church property, out of which, in connection with certain dues required of them by law, their Clergy are chiefly supported.

The Churches of England and Scotland have in Upper Canada drawn a considerable portion of the funds spent in the support of their Ministry out of the Clergy Reserves—certain lands set apart at the time of the division of the Province for the support of a Protestant Clergy—from which some other Bodies have also obtained assistance. By a Bill recently passed these lands have been secularised. The moneys derived from their sale, "whether now funded or invested either in the United Kingdom or in this Province, or remaining uninvested, or hereafter to arise from such sales, the interest and dividends" on these,—in one word, the proceeds of the Reserves,—are ordered to constitute a fund to be called the Municipalities Fund of Upper or Lower Canada, as the lands whence its contents are derived may have belonged to the one or the other. The stipends of parties receiving allowances previously to the passing of the late Act of the British Parliament authorising the Provincial Legislature to deal with the matter, are to form a first charge on this fund during the natural lives of the Incumbents where these are individuals, and for a specified period (twenty years) where the grants were made to Bodies. So much of these proceeds as may, after the

payment of the above charges, remain at the close of each year is to be apportioned equally by the Receiver-General among the several County and City Municipalities in the same section of the Province (that in which the land lay), in proportion to the population of such Municipalities respectively according to the then last census, the portion coming to each to be paid over to the Treasurer in order to its making "part of the general funds of the Municipality, and to be applicable to any purpose to which such funds are applicable." The desirableness of removing all semblance of connection between Church and State is assigned in the preamble to the Bill by way of reason or among the reasons for its provisions. Liberty is granted to Incumbents, within a given time and under certain restrictions, to compound for their claims by the reception of a present sum.

The Military defence of Canada is entrusted by her Majesty in part to such Regular Troops as it may please her to maintain in the Province, and partly to the Provincial Militia. A commander of the Forces, acting under the direction of the Governor General, who is Captain General, presides over the whole, assisted by the various Officers of both Departments. The Fortresses of Quebec and Kingston, besides which there are several minor ones, are both celebrated for their strength. It is, however, in the affectionate attachment of her people, grateful for the privileges they enjoy, and proud of their connection with the Parent State, that her Majesty possesses the best guarantee for the continuance of her authority here. If doubt may have been entertained by any in regard to the feeling of the people of Canada, it is to be hoped the zeal with which all classes and parties are uniting, from one end of the land to the other, to give expression, through their contributions to the Patriotic Fund, to their sympathy with the Mother Country, and their undying love to her, will have the effect of removing it. Long may the spirit with which her Majesty's subjects here and at home now so happily regard

each other continue. The closeness of the relationship subsisting between the parties makes it meet that it be cherished. "We be brethren." The cherishing of it will moreover prove to be as mutually beneficial as it is comely and obligatory, each party having something that it may receive from the other, and something which it may bestow in return. If to us it be pleasant to have, while yet so young, the feeling of strength and security for which our connection with an empire so powerful, supplies such a solid foundation,—it is some advantage to a country over which so many centuries have passed, to feel its strength renewed in the loving children who represent it on this wide Continent; to see its resources growing to such a magnitude and with such a rapidity through their energy; to witness their fidelity to its best principles; and to contemplate the influence which through them it is destined to exert in this new world.

So far as the limits within which an Essay like this must necessarily be confined would allow, the facts of a statistical character with which an acquaintance seemed specially requisite in order to the formation of a correct idea of our country, its institutions and its general condition, have been already supplied. To these, before closing, I beg to add a few particulars in relation to its Financial position.

"The amount of unredeemed Bonds or Debentures for which the Province is liable, directly or by way of guarantee, is embraced under the following heads:

	£	s.	d.
Imperial Guaranteed Loan	1,825,000	0	0
Debentures in England	1,727,568	11	11
" in Canada	816,612	14	9
" on account of Grand Trunk Railway	2,203,991	13	4
" on account of Municipalities	1,035,616	13	4
" on account of other special Funds	1,625,816	2	9
Total	9,234,605	16	1

Over against these responsibilities have to be placed the Public Works owned by the Province, the securities held by it for the sums advanced or granted on behalf of Railways, Municipalities, &c., and the amounts of the various special funds.

The direct Debt of the Province amounts to £4,371,315 6s. 8d. Between 31st January and 30th September last Debentures to the amount of £264,573 12s. 6d. were redeemed.

On the 1st October last there was in England, subject to the order of Government, £350,528 8s. 11d.

On the same day the Banks in Canada held £622,410 13s. 4d., subject to the Receiver General's Draft. Certain advances, however, amounting in all to £107,469, were liable to be deducted.

The cost of the Provincial Works as given in the Public Accounts for 1853 has been £5,085,244 2s. 0½d—a sum exceeding the entire of the direct Debt.

The Revenue for 1853 is stated in the Public Accounts, which are made up to January 31st, 1854, to be £1,704,350 3s. 1¼.; and the expenditure £869,681 12s. 8d. A balance of £834,668 10s. 5¼d., stood at that date at the credit of the Consolidated Fund.

In the Official statement lately made (by Hon. W. Cayley, Inspector General) to the House of Assembly, the estimated Expenditure for 1854 is £939,584 19s. 11d.; the estimated Revenue, £1,423,520—which will leave a surplus of £483,935 19s. 11d.

Some of the items included in the above estimated expenditure have been already given when dealing with the Educational Institutions of the country and its Public Charities. To these may be added the following—Contingent expenses of Administration of Justice—including £10,000 for the support of the Penitentiary at Kingston—£49,868 9s. 10d.; Militia Staff, £2,280; Legislative Council, £22,145; Legislative Assembly, £38,700; various Public Departments, £5,023 2s. 2d.; Mis-

cellaneous items, £85,572 15s. 2d.; for Agricultural Societies in Upper and Lower Canada, £16,000; for Geological Survey, £2,000; for collection of Public Revenue, £106,000; for Repairs of Public Works, £30,000; and on account of services to be provided for during 1854, £268,789 6s. 5d.

The estimated Income is derivable from the following sources—to wit:

Customs	£1,150,000
Excise	20,000
Bank Imposts	25,000
Revenue from Public Works	100,000
Militia Fines, &c.	520
Fines and Forfeitures, including seizures	4,000
Casual Revenue	20,000
Law Fee Fund, 12 Vic., caps. 63 and 64	4,500
Territorial	100,000
	£1,423,520

The character of the people of Canada we cannot dwell upon, though to omit all reference to it might be deemed an impropriety. Doubtless there are points in which there is room for improvement, in which it is called for; but take them all in all they have little to fear from comparison with any people with which we happen to be acquainted. The generous-minded stranger who comes among us has nothing to dread. He will find here, as he has done elsewhere, those who will treat him with affection, and whom he will soon learn to love and respect. Instead of an inferior character there is every thing at work which is calculated to form a character of a high order. Receiving, as we do, much of our population from the very best countries of Europe, we can hardly help, unless exposed to some specially deteriorating influence, of the existence of which we have no knowledge, to come into the possession of a moderate measure of their more valuable qualities. The comfort in the midst of which the mass of our people live, or to which they feel they can look forward,—the freedom they enjoy,—the conscious dignity which the constant exercise of

important privileges and powers imparts,—the circulation everywhere of valuable knowledge,—and, in association with all, and above all, the ennobling influence, already noticed, of Christianity,—guarantee, on every ordinary principle, the formation, and will, I hope, secure the development of a superior character, with its transmission to the generations by which the present is to be followed.

Time was, and that but recently, when it might have been necessary to defend ourselves against the charge of want of enterprise, but no such necessity exists now ; we shall, therefore, take no further notice of it. Should there be, by any chance, an individual found, still disposed to cling to the old prejudice, we would ask him to account, on his principle, for the facts presented in this Essay, which are under rather than over-stated.

There are many points on which, were it allowable, or did time permit, we would yet gladly touch ; but we must forbear. We ask no man to leave his home, be it where it may, that he may take up his abode with us. But to him who has made up his mind to emigrate we say, come ; and welcome. If you bring honorable principles with you, fair capabilities of useful exertion, including, of course, good health, with a disposition to work on for a time in hope, we entertain no fear as to your success For you and yours there is room, as well as for us,—a field for the exercise of your powers, profitable employment for capital if God has bestowed it on you, and a sphere of usefulness if you desire to make yourself of service to your race. Should you come hither, set to work with the least possible delay ; and lend us your best help to carry the country forward to the high destiny which every thing proclaims to be in store for it.

THE END.

ADDENDUM

The Report of the Ontario, Simcoe and Huron Railway, bearing date 16th July, 1855, having come to hand since Part Second was thrown off, the following particulars are added to the statement contained in page 221, closing with line 17 :

There were opened of the Line on		15th May, 1853,	30	miles.
"	"	13th June, "	12	"
"	"	11th Oct., "	21	"
"	"	2nd Jany., 1855,	31	"
		Total,	94	"

The Company possess 16 Engines, with 381 Cars of all kinds. Between 30th June, 1854, and 1st July, 1855, 4,644,110 miles were travelled, by 157,040 passengers. The number of tons of freight carried over the Road within the same time was 62,343. Its earnings amounted to £53,358 19s. 9d. ; and its expenses to £37,118 14s. 9½d.

For the two months ending June 30th, 1854, the traffic returns were $24,995.37—while they yielded $65,133.82 (an increase of $40,138.45) for the same period in 1855.

On the Line of the Railway there are 34 Grist Mills, with 84 run of stones, which turn out 2,189 barrels of flour per 24 hours ; with 104 Saw Mills, having 170 saws, and cutting per 24 hours 513,000 feet.

ERRATA.

Page 7, line 3—for Cortreal, read, Cortereal.
" — 4th from bottom—*dele* "South-eastern," and for about 1,400, in next line, read nearly 1600.
" 11, line 23—for Crssai-couda, read Crassi-cauda.
" 34, 7th from bottom—for Toronto Credit, read Toronto (Credit?)
" 36, line 4—for makes, read make.
" 37, line 7—for country, read county.
" 49, bottom line—for canal, read canoe.
" 62, line 5—for braced, read traced.
" 63, 5th from bottom—for Saint Douglas, read Point Douglas.
" 64, line 7—for Niagara Bridge, read Niagara Ridge.
" 78, line 18—for portion, read plateau.
" — 7th from bottom—for ore, read age.
" 82, 2nd from bottom—after "before us," add the words, "with that last described."
" 161, 6th from bottom—for £345,5941 5s., read £347,594 15s.
" 180, first line—for more than, read much under.
" 189, line 5—for 142,301 tons, read 1,142,301 tons.
" 190, line 2—for 2,644, read 20,644.
" 193, line 15—*dele* sterling, and add it after 1,000,000 in line 22.
" 217, 3rd from bottom—for westward, read eastward.

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